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IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA
Civil Action No. 96CV-5903

WILLIAM BARNES, ET AL.,

Plaintiffs,

vs.

THE AMERICAN TOBACCO COMPANY, INC., ET AL.,

Defendants.

CONFIDENTIAL

Deposition of:
Thomas Hamn, Jr., DVM, Ph.D.

TRANSCRIPT of testimony as taken by and before JO E. FOWLER, a Certified Court Reporter and Notary Public of the State of North Carolina, at the offices of Womble, Carlyle, Sandridge & Rice, Raleigh, North Carolina on Friday, October 3, 1997, commencing at 9:11 a.m. in the forenoon.

*Rec'd disk
*Rec'd exhibits.pdf

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ALSO PRESENT: Larry Schadle, Videographer

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P R O C E E D I N G S

VIDEOGRAPHER: This is the videotape deposition of Dr. Thomas Hamm, Jr., taken by the Plaintiff in the matter of William Barnes, et al., Plaintiff, versus the American Tobacco Company, Incorporated, et al., Defendants, Civil Action Number 96 CV 5903. This deposition is being held in the law offices of Womble, Carlyle, Sandridge & Rice located at 2100 First Union Capital Center, Raleigh, North Carolina. Today's date is October 3rd, 1997. The time is 9:11 a.m.

The Court Reporter's name is Jo Fowler representing Waga & Spinelli Court Reporting, located in Roseland, New Jersey. The Videographer is Larry Schadle also representing Waga & Spinelli Court Reporting. Will counsel now please introduce themselves.

MR. HUTTON: Mark B. Hutton from the law firms of Hutton & Hutton, Wichita, Kansas, on behalf of the Plaintiffs.

MR. EDWARDS: Craig T. Edwards on behalf of the Barnes Plaintiffs, Pennsylvania, with the law firm of Mellon, Webster and Mellon.

MR. ALLINDER: William L. Allinder,

Shook, Hardy & Bacon in Kansas City.

VIDEOGRAPHER: Will the Court Reporter please swear in the witness.

MR. ALLINDER: I'm with Brown & Williamson. We represent Brown & Williamson and Lorillard Tobacco Company.

VIDEOGRAPHER: Now would the Court Reporter please swear in the witness.

THOMAS E. HAMM, JR., DVM, Ph.D., having first been duly sworn, was examined and did testify as follows:

MR. ALLINDER: Mark, do you want me to begin with what we were discussing before we went on the record? Dr. Hamm has signed Confidentiality Agreement "A" that is a part of the protective order in this case. So, he has -- the prerequisites for using confidential documents with Dr. Hamm in this deposition has been taken care of. We do need to inquire, though, as to whether the Court Reporters have also executed Confidentiality Statement "A", because that, I believe, is a requirement as well. Do you know, Jo?

COURT REPORTER: I have not. My office may have.

MR. ALLINDER: Okay. And do you know, Larry, whether you have executed --

VIDEOGRAPHER: No.

MR. ALLINDER: -- Confidentiality Statement "A"? Do you want to deal with that now, Mark, or do you want to wait until we get to the point where we think it may be necessary?

MR. HUTTON: Well, can we get a statement from both individuals that they'll agree to one, and then we can do the paperwork later?

MR. ALLINDER: That would be fine with me. There is a protective order in this case that I believe is date -- dated April 4th of this year, and I think that there are requirements in it that indicate that if confidential information is to be used in a deposition, that the Court Reporters are to read and sign Confidentiality Statement "A", and with your agreement to do so, we will proceed.

COURT REPORTER: I agree.

MR. ALLINDER: Thank you. And Larry?

VIDEOGRAPHER: I agree, too.

MR. ALLINDER: Thank you. Mark, I

was also telling you that in addition to the materials that are included on the list that we have sent to you about what materials Dr. Hamm has reviewed and may rely on for his opinions in this case, I gave to him yesterday three additional items that I want to tell you what they are.

The first is the deposition that was taken, I believe, in the Texas Attorney General's action of Richard Kouri, that's K-O-U-R-I, on September 12th. He was an investigator of Microbiological Associates with Dr. Carol Henry.

And also, I gave to Dr. Hamm yesterday Plaintiffs' -- in this case, the Barnes case -- Plaintiffs' opposition to CTRTI's Motion for Summary Judgment of September 16th, and the Supplemental Statement of Facts that went along with it, and all the exhibits that were attached to both of those things.

MR. HUTTON: Okay. I missed something.

MR. ALLINDER: I'm sorry.

MR. HUTTON: Three items: the Kouri deposition and the Plaintiffs' Opposition Brief

Res Je --

MR. ALLINDER: And the third item was the Supplemental Statement of Facts that went along with the Opposition Brief, same day, September 16th.

And back on the Protective Order for a moment. There is a provision in the Protective Order -- I think it's paragraph 11 -- that says that if confidential information is used, we are supposed to tell the Court Reporter so that the transcript remains confidential until the period for us to review it and do -- the page and line item designations can be accomplished, and why don't we go ahead and -- and -- and presumptively use that procedure, since I assume you're going to use confidential material.

Do you want to designate it now or do you want to wait until we get to the point and say, "Okay. Now we're at" -- "we maintain confidentiality until the review period is complete"?

MR. HUTTON: Let's see if we actually get into confidential documents.

MR. ALLINDER: That's fine.

MR. HUTTON: I'll be the first to admit that I don't know the details of the Confidentiality Order, although I'll be agreeable to be bound by one. I have signed that agreement.

MR. ALLINDER: Okay. I have one with me if you want to take a look at it, but the -- the only thing that it says on there is if you use it, we have to tell the -- if you use confidential information, we tell the Court Reporter so confidentiality can be preserved for the period of time that counsel can obtain the transcript and review it.

MR. HUTTON: I hate to start off at the front end of a deposition presumptively saying that everything is confidential. I'd rather wait until we get to something confidential, and then perhaps at that point --

MR. ALLINDER: I'm perfectly agreeable with that.

MR. HUTTON: Heavy burden on the Court Reporter. Okay. Everybody ready? Has the witness been sworn?

COURT REPORTER: (Nods head.)

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EXAMINATION

BY MR. HUTTON:

Q. Good morning, Dr. Hamm.

A. Good morning.

Q. We have been furnished with a copy of your Curriculum Vitae, and I will not mark that, but is there anything that you know of in the last three months that you would like to add to your Curriculum Vitae?

A. I can't think of anything.

Q. You have been deposed before, have you not?

A. That's correct.

Q. "Deposed" meaning you have actually given testimony under oath before, have you not?

A. That's correct.

Q. And you were deposed in the Mississippi State A.G case; is that correct?

A. That's correct.

Q. You were deposed in the Browin secondhand smoke case in Florida, were you not?

A. That's correct.

Q. Any other depositions?

A. I was recently deposed in the Minnesota State case, as well.

Q. Do you recall the name of the counsel on behalf of the State, on behalf of -- of the insurance company that took your deposition?

A. I'm sorry. I don't recall his name.

Q. Do you --

MR. ALLINDER: You're asking about Minnesota?

MR. HUTTON: Minnesota.

BY MR. HUTTON:

Q. Was it Mike Ciresi?

A. I honestly don't remember.

Q. Have you been furnished a copy of that deposition for review?

A. I just received it day before yesterday, and I haven't had time to look at it yet.

MR. ALLINDER: We sent a copy to Tom Mellon two days ago.

MR. HUTTON: Of that deposition?

MR. ALLINDER: (Nods head.)

MR. HUTTON: Great. Then I can move on.

BY MR. HUTTON:

Q. Have you been scheduled to give any other depositions in smoking-related cases,

smoking-related matters beyond today's deposition?

A. No, I have not. There's no -- nothing scheduled after the one today.

Q. I will not try to go over old ground and repeat some of the same questions that you have been asked in the past. If I do, it's only because I need some foundation to work into some of your opinions and some of your testimony, but if I recall a deposition, you have testified that you are a consultant, are you not, for Shook, Hardy & Bacon?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I -- I don't know the exact -- I -- as an academic, I'm a professor, and I count everything I do other than being a professor that's in my professional line as being a consultant. So, I don't know if that -- if there's any special definition of what a consultant is, and I list Shook, Hardy & Bacon as a consultancy on my CV.

BY MR. HUTTON:

Q. Yeah. That's exactly why I used the word "consultant." I think on your Curriculum

Vitae that you furnished to counsel, you designate Shook, Hardy & Bacon as the party to whom you consult for; is that right?

A. I -- I have, yes. I have been a consultant for Shook, Hardy & Bacon.

Q. Now, in this case, however, you are an expert, are you not?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: Yes. My -- what I view is I'm an expert witness today.

BY MR. HUTTON:

Q. You -- have -- you, or through counsel, have provided us with an expert disclosure statement, and you have some input in what you agree you will testify to in this case; is that correct?

A. That's correct.

Q. In fact, you signed your name to that document, did you not?

A. That's correct.

Q. Would you share with me: What's your understanding as to the difference you feel that your role is as a consultant to Shook, Hardy & Bacon versus your role as an expert in

this litigation?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I'm not sure of the legal definition of either of those terms, and I have viewed myself as an expert throughout being a consultant, but originally what I was asked to do for Shook, Hardy & Bacon was to review scientific articles, which I did. At some point approximately two years ago, I was asked if I would serve as a witness in these trials, and I agreed to do so, but my role in a sense hasn't changed any in that I view myself as an expert in these matters. That's why I was being asked to be a consultant. So, I'm not certain if that answers your question or not.

BY MR. HUTTON:

Q. Are you a consultant for any other law firm where you're additionally expected to testify as an expert for that same law firm?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I don't serve in any capacity for any other law firm.

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BY MR. HUTTON:

Q. I believe -- and correct me if I'm wrong. If I make a misstatement, be sure and correct me, but I think approximately you have billed Shook, Hardy & Bacon $136,000.00 as of May -- or excuse me -- as of March of 1997, approximately. What are your total billings to date?

A. I really don't know. I have been doing a -- you have seen the list of all the documents that I have been reviewing. So, I have been spending a large number of hours reading those documents, and I would guess I'm billing approximately $25,000.00 or $30,000.00 a month at this point.

Q Would that be to $20 --

A. But I haven't kept a total. I could get that information if you need a more specific number.

MR. ALLINDER: Excuse me just a moment. Mark, I don't know what the practice has been in this case on making the inquiry that you're making right now. I have no objection to it as long as you agree that continuing with this examination does not affect any position

that we have about the appropriateness of this line of inquiry with other witnesses.

MR. HUTTON: I agree.

MR. ALLINDER: Okay.

MR. HUTTON: Whatever the lawyers agree to, I'll -- I'll be bound by that agreement.

MR. ALLINDER: Okay.

MR. HUTTON: I'm not in a position to make agreements on behalf of the lawyers in Pennsylvania on the Barnes case. I am on other cases, but not the Barnes case.

BY MR. HUTTON:

Q So --

MR. ALLINDER: Sorry. May I ask for a clarification on that? Does that mean that the agreement that you just gave me does not -- you don't think is binding on the other Plaintiffs' attorneys in this case? You just said that you can't -- you can't make agreements that bind the Plaintiffs in the Barnes case. I don't fully understand that.

MR. HUTTON: No. No. I'm subject to any agreement that the counsel have made --

MR. ALLINDER: Right.

MR. HUTTON: And I'll -- I'll honor that agreement.

MR. ALLINDER: I understand that.

MR. HUTTON: I just don't know what all the agreements are.

MR. ALLINDER: Okay. And I don't really, either, and the only thing that I was asking from you right now is the agreement that if I permit to this line of questioning, which I -- which I will, I won't object to -- that it's not going to affect any position that we're taking in this case regarding this area of inquiry.

MR. HUTTON: I understand. I just can't make any new agreements that have not been discussed by everybody, but I am subject to all prior agreements, yes.

MR. ALLINDER: All right.

BY MR. HUTTON:

Q. Based upon your hard work and your review of numerous documents, you have been averaging about, what, $25,000.00, $30,000.00 a month billings?

A. It's about that.

Q. That would be thirty -- $25,000.00

to $30,000.00 a month since March of 1997?
A. I believe so.
Q. What is your understanding as to --
A. I -- I should say that includes depositions, and that's where some of the billings have gone up, is I'm doing a lot more of this. So --
Q. What is your understanding as to how long this $25,000.00 to $30,000.00 a month will continue?
A. As of today, they owe me until the third of October, and -- and that may be the last -- I guess I'm going to have to read this deposition, and I'll charge them for that, too. So, there's no -- there never has been any agreement of what happens in the future.
Q. I'm just curious, because $25,000.00 to $30,000.00 a month for a year or two is a lot of money, is it not?
MR. ALLINDER: Object to the form of the question.
THE WITNESS: Believe me, I'm earning every penny of it. If you look at that list of things that I'm reading, I'm putting in a lot of hours.

BY MR. HUTTON:

Q. Based upon that last answer -- you're earning every penny of it in reading the voluminous materials you're reading -- I'm assuming that a lot of materials that you have read are materials that have been given to you by Shook, Hardy & Bacon?

A. They have given me a -- a lot of things, because I don't have any other way to get them, and I've -- they've told me what things are available, and then I have been asked to request which documents I would like to read. And so, that's the reason, and they have been sending me memos and so forth that I couldn't get any other way.

Q. They have been giving you memos, but they have been also giving you medical literature, scientific literature, have they not?

A. They have. The agreement there has been it's much easier for them to get things. It takes a lot of time for me to go to the library and get them, but some of the things I have gotten myself, and some of the things that are on the list -- and including I had quite a few

things before I ever met Shook, Hardy & Bacon. So, some of the things in my notebooks and so forth were papers and so forth that I had prior to ever getting involved in this particular --

Q. I guess the point I'm trying to ultimately make, sir, is some of your knowledge, if not a lot of your knowledge, is dependent upon the information that is given to you by Shook, Hardy & Bacon. Your knowledge. I'm not saying necessarily your opinions or conclusions, but the -- the data.

A. They -- they have given me many boxes of information, some of which I have requested, some of which they have sent me.

Q. And some of that would include some medical literature, scientific literature, would it not?

A. It does.

Q. Before we get into articles, literature, documents that you may or may not have seen, let me start with some basics so I can understand where you're coming from, if I could. I have been furnished with an expert disclosure statement that reasonably sets forth the subject matter of your expert opinions. You

have been asked in other depositions whether or not cigarette smoking can cause cancer, lung cancer specifically, and I believe one of your answers was that -- in part was that you could -- could change your opinion. Now, do you recall giving that answer?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I -- I don't recall, and it probably was in some kind of context, but certainly, as a scientist, I'm trained to always look at new information and -- and try to keep an open mind and try to -- so, I think I could change my opinion on a lot of scientific matters if the data was available.

BY MR. HUTTON:

Q. Very good. Very good. And I will give you some new information perhaps you have not seen that may impact or may alter or influence any opinion you may or may not have on the issue of causality, the relationship between chronic cigarette smoking and cancer. We'll get to some of those documents and articles later, but let me at least tie you down, if I may, with some of your opinions so I can understand where

your thought processes are as of today's date. First of all, do you believe that cigarette smoking can cause or contribute to cause cancer?

MR. ALLINDER: I want to object to everything that preceded the question. Go ahead.

THE WITNESS: I believe that the epidemiology has shown -- and there have been a number of studies -- have shown that there's -- that there's some kind of a link between cigarette smoking and cancer, but I do not believe that anyone has been able to determine what that link is, and the first thing you learn in statistics is correlation does not imply causation. So, until there is more known about the mechanism, as a scientist, I can't use the terms in exactly the way that they are being used.

On the other hand, I'm -- I -- I don't smoke. I don't recommend anybody does smoke. I think there's sufficient epidemiologic evidence to show that you are increasing your risk of getting cancer.

BY MR. HUTTON:

Q. Let me see if we could dissect some

of those thoughts that you have expressed here. Now, when I ask you a question calling for an opinion, to make sure that you understand, the burden of proof, at least in this case, is whatever is medically or scientifically probable. Doctor, you as a scientist, you're trained and you speak from a scientific certainty point of view, do you not, what is scientifically certain, do you not?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I don't think I understand what you mean by "scientific certainty."

BY MR. HUTTON:

Q Well, I can't define words for you. I want you -- I want to have you tell me how you are using words. When you answer my questions, are you answering questions that it's more likely than not, it's probable, or are you answering questions to a scientific certainty that is 95 percent or more certain or not certain there is a relationship between an event, an act and a result?

MR. ALLINDER: Object to the form of

the question.

THE WITNESS: It's -- in this case, if we're discussing causality with cigarette smoke and lung cancer, until we know something about the mechanism -- which we know practically nothing right now. All we know is there is an association between cigarette smoking and cancer, but there's a large number of people who smoke who don't get cancer. There's people who don't smoke who get lung cancer. And so, to say that -- that we have proven causality is -- is -- is just not possible from a scientific standpoint at all.

BY MR. HUTTON:

Q Okay. But Doctor, let me inform you that when I ask you questions from here on out, I'm asking you questions to a probability. Whatever so slightly tips the scales, what is 51 percent or more certain. Not what is absolutely certain, not what is scientifically certain, but what is probable. Whatever tips the scales ever so slightly. So, please, from here on out, answer my questions as to what is medically or scientifically probable. Fair enough?

MR. ALLINDER: Object to the form of

the question.

THE WITNESS: Well, I can't take that assumption, because there's no way in this case to -- to tip a scale 51 or 50. There's so little known about the mechanism that there's nobody on the planet can tell you the probability here.

BY MR. HUTTON:

Q. Doctor, you keep talking about, "We don't know the mechanism, and therefore, we can't say there's probable cause and effect between chronic cigarette smoking and cancer"; is that what you're saying?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I'm saying that we know it isn't necessary for smoking to cause cancer, we know it isn't necessarily sufficient to cause cancer, and therefore, it's very difficult to start saying we can tell whether it's 49 or 51 or 52 percent probable. We know that there are epidemiologic studies that show that people who smoke are more likely to get lung cancer, a very small number of people. We don't know any more than that. Nobody knows

more than that.
BY MR. HUTTON:
Q. You know --
A. Now, I don't smoke. I take that, and I think in a public health standpoint, someone can say it's better for people not to smoke because of this -- of this association, but I can't tell you whether it's 49 or 51 or -- or 52, nor can anybody else.
Q. Doctor, you are seizing upon the absence of a mechanical -- or excuse me. You are seizing upon the absence of the mechanism, the knowledge of the exact mechanism, to say that we don't know if cigarette smoking can cause cancer, are you not?
MR. ALLINDER: Object to the form of the question.
THE WITNESS: No. I'm -- I'm simply giving you my professional opinion of how I view cigarette smoking. I'll give you an example. The majority of scientists on the planet used to think that swamps caused malaria, and there were good, epidemiological studies to show that was the case, but we know that isn't the case anymore. We know that mosquitoes -- then for a

while, people thought mosquitoes caused malaria, and we know that isn't the case. There's a parasite in the mosquito that causes malaria. So, now we know what the cause of malaria is.

BY MR. HUTTON:

Q. Okay. What you have just said here, that even though the majority of the scientists believe that chronic cigarette smoking can cause cancer, even though the majority of those scientists believe that way, you believe that history will prove -- will prove that cigarette smoking doesn't cause cancer. That's what you're telling this Court and jury, are you not?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: No. That's not what I said at all. I am not even sure the majority of scientists believe that we have the cause of -- of cancer. The majority of scientists know that we have an association -- an epidemiologic association that's repeatable, that's done in a number of studies. And so, they are willing to accept there is some association.

BY MR. HUTTON:

Q. But Doctor, you know that merely

because there is an association, that doesn't mean there's causation; that's correct?

A. That's the first thing you learn in statistics, because there are numerous examples, and I have given you one, the malaria example, where the association definitely did not prove causation.

Q. I hear what you're saying, and you're saying because there is only an association, therefore there's no causation?

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. Correct?

A. I didn't say that at all. There may be a causation. That's still possible that when the mechanism is known, it will be shown that cigarette smoking directly causes cancer by some mechanism or by many mechanisms.

Q. You're saying there may be a mechanism, there may be causation, but we won't know until there is an adequate explanation of mechanism; is that what you're saying?

MR. ALLINDER: Object to the form.

THE WITNESS: We won't know what the mechanism is until we know what the mechanism

is, I guess is the only way I can phrase that.
BY MR. HUTTON:
Q. But you're not comfortable with saying there's probable cause and effect between cigarette smoking and some cancers until there is an adequate explanation of mechanism to you?
A. I -- I'm comfortable with saying that there are a number of epidemiologic studies which show there's a -- there's an association and that cigarette smoking is a strong risk factor in smoking.
Q. What will it take to convince you that there is a probable -- more likely than not -- relationship between chronic smoking and some types of cancer?
MR. ALLINDER: Object to the form of the question.
THE WITNESS: I have already said the epidemiologic studies show a strong association that it is a risk factor. I don't know why I have to -- why it's even important what I think about the causation, but to get to causation in any chronic illness, we're going to have to know what the mechanism is. There could be other things that cigarette smoking is

associated with that are the true mechanism or the true causation.

BY MR. HUTTON:

Q. You know the history of science and medicine has reflected that there are many examples where -- between bacteria and disease, that there is unquestionably a probable cause and effect relationship between bacteria and disease, unquestionably, however, never has an exact mechanism between the bacteria and the disease ever been established, but physicians and scientists have never questioned the probable cause and effect relationship. Why don't you tell me some of those examples.

MR. ALLINDER: Object to the form.

THE WITNESS: Well, in fact, I'm glad you opened this up, because with bacteria, you have the ability to fulfill Koch's postulates. So, it's much simpler with a bacterial disease to prove that a bacteria causes it. We now are working with a chronic disease with probably multiple mechanisms where it's going to -- and there is no way to fulfill Koch's postulates. So, it's much more difficult to -- to have a direct cause and effect sort of

experiment. So, that's exactly the problem that we're in right now trying to understand this mechanism.

BY MR. HUTTON:

Q. Doctor, the problem is that fulfilling of Koch's postulates will prove causality to a scientific certainty, will it not?

MR. ALLINDER: Object to the form.

THE WITNESS: I still don't know what you're calling scientific certainty, but fulfilling Koch's postulates is the way you can determine that a bacteria is the cause of a disease.

BY MR. HUTTON:

Q. So, the --

A. That bacteria becomes necessary, sufficient and all the other criteria that are needed, and you can -- you can put it in and take it out of the system, you can cause it and not cause the disease. Those kinds of experiments can't be done with long-term chronic diseases.

BY MR. HUTTON:

Q. You don't think the history of so many people dying of lung cancer is not enough

to convince you there is probable cause and relationship between chronic smoking and some types of lung cancer? That is not enough to convince you that it's probable that there is a relationship between chronic smoking and some types of cancer?

MR. ALLINDER: I object to the form.

THE WITNESS: I believe the epidemiologic studies have very -- have proven that there's a strong association that smoking is a risk factor in lung cancer, yes.

BY MR. HUTTON:

Q. But when you say, "risk factor," you're not saying, "probable cause and effect," are you?

A. When I say, "risk factor," I'm referring to the fact that there are many risk factors in lung cancer, there are people who get lung cancer who have never smoked, there are people who smoke who don't get lung cancer, and those are the things that we can't dissect out as far as causality. So, there are many risk factors that affect a particular person getting a -- a cancer.

Q. All the opinions that you have set

forth in this disclosure statement, all the opinions that you intend to give at the time of trial is similar to the opinions that you have given here today so far that we can't say that chronic cigarette smoking can cause certain types of lung cancer? That's the same type of testimony you want to give to this Court; is that correct?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: No. The thing I have been saying in my response each time is I believe that the epidemiology has -- has proven that smoking is a -- is a risk factor in lung cancer in humans.

BY MR. HUTTON:

Q. Don't you --

A. I don't know how that relates at all to my other opinion -- you know, you can't -- it's not universal that all my other opinions are related to that.

Q. Don't you believe that Americans, people in the United States, should be able to expect the products -- products like cigarettes should be marketed that are safe?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I'm for all products being safe, but, in fact, the majority of products have problems with them. So, almost every product has some adverse effect on the population, but, of course, I'm for things being safe just like everyone else.

BY MR. HUTTON:

Q. Let me ask you not what you're hoping for. Let me ask you what you expect. Don't you expect the products marketed in the United States should be safe?

MR. ALLINDER: Object to the form.

THE WITNESS: I -- all I can do is give what I hope for and expect, because if we set a standard that no park -- no thing would be marketed unless it was 100 percent safe, then we probably wouldn't market almost anything. All the drugs that we use are not 100 percent safe. The food we eat isn't 100 percent safe. So, we have the problem -- problem with every product, that there are adverse effects from almost every product.

MR. HUTTON: Let me have the Court

Reporter mark as Exhibit Number 1 a newspaper article, and I'll identify this for the record.

(EXHIBIT NUMBER 1 WAS MARKED FOR IDENTIFICATION)

BY MR. HUTTON:

Q. Exhibit Number 1 is a copy of a letter to the editor that was authored by Thomas E. Hamm, Jr., in the San Jose Mercury News paper published Sunday, August 9th, 1992. Let me hand the exhibit to you and make sure that I have properly identified that and see if you recognize that.

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

THE WITNESS: I -- I remember writing this, but let me read it so that I can refresh my memory. I think this is an excellent article.

MR. ALLINDER: There is no question pending. You need to let him ask a question.

BY MR. HUTTON:

Q. Doctor, you shared with us words of wisdom. This Exhibit Number 1 contains some excellent thoughts by yourself, does it not?

A. Yes.

Q. And you state in the letter to the editor, quote, "We should be able to expect that

products marketed in the United States are safe." You said that, did you not?
A. That's correct.
Q. Thank you.
A. But I don't think that changes at all that this is a letter to the editor, and if I were to expand that to something like a chapter in a book or something, I'd have to qualify that that most products that are marketed after we test them, we know they are not 100 percent safe.
Q. The title of the letter to the editor is quote, "Don't Risk Using a Product if it Hasn't Been Properly Tested." Is that your title?
A. That's correct.
Q. Do you agree with that principle?
A. That's correct. I think things should be properly tested.
Q. And you agree with that principle as it pertains to cigarettes?
A. I believe that it pertains to every product.
Q. Then, I assume that, therefore, that as a consultant, as an expert on behalf of the tobacco industry, you feel that cigarettes have

been properly tested; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: I have already said that I don't smoke, I don't recommend anybody smoke, and my title is, "Don't Risk Using a Product if it Hasn't Been Properly Tested." The problem with testing cigarette smoke is it has been difficult to develop an animal model.

In this context, I'm talking about testing cosmetics where an appropriate animal model has been developed, and so, it's -- it's kind of -- it's not a direct comparison. So, here I'm talking about testing cosmetics where there is an appropriate animal model. They have been unable to develop, even though they have tried very hard, to develop a good model for testing cigarettes.

Q Do you have an opinion that the cigarette companies have adequately tested the product before they marketed cigarettes?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: "Adequately tested" is -- is -- would have to be defined, and I would say based on what's available, they have done

everything they can to test their product, but I have already stated that -- that it's difficult with any disease or anything that you're testing if you don't have a -- a good, adequate animal model to use. They have spent a tremendous amount of time trying to develop such a model.

And they have used the models that are available, although some of those I do not feel are adequate. So, I don't feel skin testing of mice is an adequate model, but it's the only model that was available for periods of time. And so, they did use it.

BY MR. HUTTON:

Q. If the manufacturers of cigarettes had the technological capability and the capacity to make a safer cigarette, do you believe that they had the obligation to do so?

A. I -- I believe that they, in fact, would do so, and I think they have tried to do so.

Q. They have tried to do so or have not?

A. They have tried to do so.

Q. So, it's your testimony the manufacturers have tried to make a safer cigarette?

MR. ALLINDER: Object to the form of the question.

BY MR. HUTTON:

Q. Is that what you're telling the Court?

A. There -- there have been attempts to try to make a safer cigarette. Any -- any organization would always try to make their product safer.

Q. Share with us your knowledge and your opinion and your thoughts as to how the manufacturers have attempted to make a safer cigarette.

MR. ALLINDER: Object to the form of the question.

THE WITNESS: They attempted to develop animal models so that they could test fractions of cigarettes and different types of cigarettes to determine if one was safer than another. They have tested different fractions and different types of cigarettes on the models that were available, such as the skin painting model, to see if they could find a safer cigarette. Those are some of the examples I'm thinking of.

//

BY MR. HUTTON:

Q. Have they attempted to remove carcinogens from the product to make a safer cigarette?

MR. ALLINDER: Object to the form.

THE WITNESS: The -- the point of the experiments where they were testing different fractions and different -- different cigarettes was, in fact, an attempt to find if they could find a fraction that -- that could be removed, but I think they have failed in those attempts to find the -- the association with cancer is so weak and the animal models are all negative, that they have been -- it has been difficult to do any more than what they have done.

BY MR. HUTTON:

Q. The association is so weak. The association of what is so weak to what?

MR. ALLINDER: Object to the form.

THE WITNESS: If -- if -- if you look at the data, if cigarette smoking is a carcinogen, it's a very weak one, and Henry and Kouri, in fact, say that in their analysis of their own data.

BY MR. HUTTON:

Q. Well, share with us: What carcinogens are in cigarettes, cigarette smoking to -- to smoke?

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. Let me strike that question. Two questions. First: What are the carcinogens in cigarettes? And second is: What are the carcinogens, if any, in cigarette smoke?

MR. ALLINDER: Object to the form.

THE WITNESS: It -- it's not my area of expertise, but there are hundreds of compounds in -- in the -- the tobacco, and there are -- anything -- when you grill a steak, anything that's burnt creates other compounds, and cigarette smoke is the same. So, there are hundreds of different compounds, many of which are known carcinogens.

BY MR. HUTTON:

Q. Doctor, I have seen you talk about the -- the grilling of steaks before. We don't eat 40 or 60 steaks a day, do we, like people that smoke 40 to 60 cigarettes a day?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't -- I certainly don't. I don't think anybody could eat that much, but you might be getting a higher dose in one steak than you're getting in 40 or 60 cigarettes, because the dose is what's important, and you'd have to look, and it isn't my area of expertise, so I don't know what dose you're getting from one steak or from 40 cigarettes. It surprises me, though, that anybody smokes 40 cigarettes a day, as well. So, I think a lot of smokers smoke less than that.

VIDEOGRAPHER: Sir, wait just a moment, Sir --

MR. HUTTON: Sure.

MR. ALLINDER: Excuse me just a moment, Mark. You need to be a little bit concerned about remaining somewhat stationary --

THE WITNESS: Oh, I'm sorry.

MR. ALLINDER: -- so the Video Operator can keep up with you a little better.

THE WITNESS: Yeah. I'm sorry. That's a habit I have. I'm sorry.

BY MR. HUTTON:

Q. So -- so, what you're generally

telling this Court is that you believe it's more dangerous to eat a grilled steak than it is to smoke cigarettes?

MR. ALLINDER: Object to the form.

THE WITNESS: I didn't say that at all, but you're exposed to a large number of carcinogens in a variety of ways, and what's important is the dose of those carcinogens. So, the mere fact that a carcinogen exists in something that you ingest or that you smoke may be of no effect upon whether you're going to get cancer or not.

BY MR. HUTTON:

Q. Not only is the dose important, but how often you're exposed to that carcinogen is likewise important; correct?

A. That -- that's correct, and that's why it surprises me that any -- I don't smoke at all. It surprises me that those people who do smoke, smoke as many cigarettes as they do, because they're really getting a large dose of whatever is in there.

Q. They're getting a large dose of carcinogens, are they not?

A. It's not my area of expertise, so I don't

know exactly what dose they're getting, and I don't know whether it would be considered large or small. It's very hard to rank carcinogens, as well, but that's really not my area of expertise.

Q. Doctor, can you think of any other product in America other than cigarettes that kills its best customers?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't know what you mean by "kills its best customers." You mean the people that use the most of the product are the best customers?

BY MR. HUTTON:

Q. For the longest period of time --

A. Well, then, food would be a good example. So, people that overeat are dying of -- of atherosclerosis and other problems of obesity. So, I guess I'd say food is a good example.

Q. We need food for nutrition. We don't need cigarettes for nutrition, do we?

A. When we're talking about the best customers, we don't need enough food to become tremendously obese. So -- but I don't think -- I'm not an expert on why people smoke, but there

must be something there for so many people to do it.

Q. Let's talk about what's there that makes it so that so many people smoke cigarettes. Have you ever thought that perhaps nicotine is the reason that so many people for so many years smoke so many cigarettes?

A. It's not my area of expertise. So, I don't know what all the things are that motivate people. Nicotine is one of the things.

Q. And -- and one of the reasons nicotine motivates people to smoke is because nicotine is addictive; correct?

MR. ALLINDER: Object to the form.

THE WITNESS: Again, addiction is not my area of expertise, and the words are used very precisely, and it seems to me to be more of a habit, but it's not my area of expertise. But certainly I know a lot of people who don't. Appear to me to be addicted in the sense that I'd view addiction, but it isn't my area of expertise.

BY MR. HUTTON:

Q. As a Ph.D. scientist, from your knowledge of the review of all these documents,

all the medical literature that's been given to you by the Shook, Hardy & Bacon firm, as a scientist, you believe that it's probable that nicotine is addictive, do you not?

MR. ALLINDER: Object to the form.

THE WITNESS: It's not my area of expertise, and I don't know the def -- you know the true definitions that the people in that field use for "addiction." And so, as a scientist, I don't think I could give you -- the best answer I can give you is -- is as more of a lay person who happens to have a scientific background, but as a scientist, I don't work in the area of addiction.

BY MR. HUTTON:

Q. As a lay person, would you admit that nicotine probably is addictive?

MR. ALLINDER: Object to the form.

THE WITNESS: I guess it's -- it's always conflicting whether I am a lay person or a scientist, but as a -- talking as a lay person with a scientific background, I'd want to know more about what -- how addiction is really defined and so forth, but my -- as a lay person, it appears to me that -- that people are not

addicted in the sense I think they're addicted to cocaine or heroin. I have had to fire people and I have had to -- some of my employees have ended up in jail because of addiction to things like cocaine, heroin and so forth, and I have never really had that problem with cigarette smokers.

BY MR. HUTTON:

Q So this Court will have a clear understanding as to your opinions in this case, whether as a scientist, as a Ph.D., a physician or as a lay person, you don't believe that chronic cigarette smoking can cause cancer, you don't believe the nicotine is addictive; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: I didn't say either of those things. I believe that -- that there's an association and that cigarette smoking is a strong risk factor in lung cancer, and for that reason, I don't smoke and I don't recommend anybody else smoke. And as far as addiction goes, it doesn't appear to me to be addictive in the sense I think of addiction, but I could be wrong, because it isn't my area of expertise.

BY MR. HUTTON:

Q. Let me have you assume, for the sake of my questions, a factual predicate, and you may not necessarily accept what I'm saying is true, but for the purpose of my question, assume that it's true. Now, let's assume, for the sake of my question, that chronic cigarette smoking can cause certain types of cancer. Just assume that factual predicate. Assume that's true. Now, if you assume that's true, do you agree that cigarettes as a product are unreasonably dangerous?

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. You may answer that. Assume -- assume my factual predicate.

A. I don't have trouble assuming that, because that is a possibility, and -- but could you repeat the second part of your question?

Q. Okay. Assume that possibility is true, and I'm not saying that you have to accept it, but assume it as a possibility, then will you agree that -- if you assume that's true -- that cigarettes are unreason -- unreasonably dangerous?

MR. ALLINDER: Object to the form.

THE WITNESS: I -- I have never thought in terms of -- of unreasonably dangerous. Every product has -- food, for example, I could probably easily say it's unreasonably dangerous as well, because you could get cancer from it, you can get heart disease from it and so forth. So it's hard for me to put with any product where I'd say it's unreasonably dangerous. The nice thing about this product is since '64 it's said right on the pack, "Do not smoke this, because it causes cancer." And so, at least in that case, it's probably better than many products in that I think the consumer is forewarned that -- that it is dangerous.

BY MR. HUTTON:

Q. Are you saying the Surgeon General's warning opens the door for these manufacturers to target the youth, to addict the young children to smoke cigarettes?

A. No.

Q. That's what you're suggesting and inferring?

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. Are you?

A. No. I'm not saying that at all. I'm saying that as a product, at least the warning is there so people are adequately warned, whereas there are many other products that are -- that are dangerous where I don't think there is the same adequate warning.

Q. Okay. You have offered some opinion regarding the adequacy of the warning, Doctor. Does the carton of cigarettes or the side, the label, the warning on the pack of cigarettes, do those cigarettes say that cigarettes can cause and do cause cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: I'm not a smoker, so I don't look at the -- and I know there is a number of different labels, but one of them does say, "Warning: The Surgeon General has determined that cigarette smoking causes cancer," or words close to that effect, and yet, another one says, "Warning: The Surgeon General's" -- "This will affect pregnancy. It has carbon monoxide" -- there are a number of other warnings.

Q. But -- but you disagree with that warning?

MR. ALLINDER: Object to the form.

THE WITNESS: I did not disagree at all with that warning.

BY MR. HUTTON:

Q. Well, you've told us that cigarette smoking doesn't cause cancer.

MR. ALLINDER: Object to the form.

THE WITNESS: I didn't say that, either. I said that the epidemiologic studies have shown there is an association that -- that cigarette smoking is a strong risk factor in cancer. For that reason, I don't smoke, and I think the Surgeon General, looking at the data available at the time and putting that warning on the packs, was appropriate.

BY MR. HUTTON:

Q. If you assume that cigarette smoking can cause cancer, do you believe that the risk of that product outweighs its benefits?

MR. ALLINDER: Object to the form.

THE WITNESS: Risk benefit analysis is not my area of expertise. There are people that that's specifically what they do, and I

don't -- I don't know enough about all the risks and all the benefits to do that kind of an analysis, and as a nonsmoker, I don't really understand the benefits, but it must be a lot of people benefit, based on how many people really do it, even in spite of all these warnings.

BY MR. HUTTON:

Q. Doctor, let me have you assume another factual predicate. Let's assume, for the sake of my question, that nicotine is addictive, and it's the nicotine component of a cigarette that gets people to want to smoke more cigarettes, more cigarettes and more cigarettes. So if you assume, for the sake of my question, that nicotine is addictive, do you agree that if the manufacturers can make a cigarette that is less addictive, contains less nicotine, that they should do so?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, I didn't have a problem with your -- it may cause cancer, because it may, but when we get into addictive, I -- I have trouble accepting the premise, because it just doesn't appear to me to be addictive. And so, then if I can't accept that,

it's hard to go on with the next part of the question --

BY MR. HUTTON:

Q. Doctor, with your scientific mind, I believe that sometimes you will be able to accept something as true for the sake of answering a question. I don't doubt your capability of doing that.

MR. ALLINDER: Object to the form.

THE WITNESS: Is that a question?

BY MR. HUTTON:

Q. Well, it's kind of statement I'm making. I'm just asking you to accept a principle, and take that principle and then answer a question. The principle is: Nicotine is addictive. Okay? And it's the addictive component of the cigarette that gets the individual to keep smoking. If you accept that principle, then the question is: If the manufacturers can make a cigarette that is -- that contains less nicotine, that is less addictive, don't you believe that the manufacturers have the obligation to do so?

MR. ALLINDER: Object to the form.

THE WITNESS: It -- it -- it's just

assuming so many things that I can't assume that it makes it very difficult to -- to get -- get to the final part of the question.

BY MR. HUTTON:

Q. Okay. So, is it your inability to make that assumption that keeps you from answering the question?

A. What keeps me from answering the question is you're setting up a number of things that -- each one of which is unproven, and then trying to get me to say at the end that they should do something, and I don't know how any company could decide to do something based on assumptions that are unproven.

Q. And that's your best answer to my last question?

MR. ALLINDER: Object to the form.

THE WITNESS: I could keep trying, but I think that's about as good as I can do.

BY MR. HUTTON:

Q. I understand. All right. Let me get into a couple of questions regarding the Microbiological Associates, Inc., research, if I may call that the MAI research; is that okay?

A. That's fine.

Q. You have reviewed the MI -- the MAI research, have you not?

A. Yes, I have.

Q. Have you reviewed all the MAI research?

A. I have reviewed --

MR. ALLINDER: Object to the form. Are you asking about that that was funded by CTR or are you going beyond?

MR. HUTTON: Very good.

BY MR. HUTTON:

Q. Counsel made a very good objection. I was artfully --

MR. HUTTON: My other --

THE WITNESS: I was going to say the same thing.

MR. HUTTON: I was vague, but let me be much more precise.

BY MR. HUTTON:

Q. CTR has funded certain MAI research, have they not?

A. Yes, they have.

Q. And you have reviewed some of that MAI research; is that correct?

A. Yes. Yes, I have.

Q. Is it your understanding that you have reviewed all the MAI research funded by CTR?

A. I have attempted to review all of the research funded by CTR, but there's a -- it's very extensive.

Q. Give me your working knowledge and understanding as to what CTR-funded MAI research that you have reviewed, and categorize it or describe it however you want to.

A. Well, and I should qualify it a little in that I focused more on the animal-based research, because they did, as well, human studies and tissue culture studies and a variety of other kinds of studies, as well. I have seen information about those studies, but since that's not my area of -- of expertise, I focused more on the animal-based experiments.

And what they attempted to do with the work at MAI was to develop a mouse model for testing cigarette smoke by inhalation to determine if they could create a model where they could get mice to develop lung cancer, and there were a variety -- there's probably 60 or so papers came out of that work, because it

began with a lot of developmental work to pick the right model and validate the machinery and so forth, and then it went on to a long-term -- a lifetime study to determine if they had developed such a model.

Q. So, is it your -- your understanding that you have reviewed all of the animal research that was done by MAI that was CTR funded?

A. I have attempted to do that, yes.

Q. Just attempt to quantify. Are we talking about a Perma Pack box of research documents you reviewed or 50 Perma Pack boxes?

A. We're talking more like 50 boxes.

Q. Fifty?

A. But 50 might be an exaggeration, but it's more -- I would say it isn't one and it isn't 50, but it's 25 or 20 --

Q. Somewhere in between?

A. Somewhere in there.

Q. Okay.

A. It's a very large amount of material, and a lot of it is redundant, because I looked at both the CTR files and I looked at the micro files.

Q. The micro?

A. I'm sorry. MAI files.

Q. And I think you've said that CTR has funded other MAI studies that are human based?

A. They -- they funded -- and it's difficult at some points to tell, and I didn't pursue the -- if it wasn't animal related, I didn't look at it as much, but they were funding other studies that were -- involved other end points. So, they had tissue culture studies, and I believe they did some human studies, as well.

Q. But what I'm going to --

A. But I might -- I may be ex -- I didn't go into that part. So, when I started off in that direction, if it wasn't animal oriented, I -- I didn't go into it any deeper than that.

Q. That's what I -- I'm trying to pin down, is you have looked at the animal data, but if there was any other research done, whether on humans or it's the tissue, that was not your area of concentration, and, therefore, did not review that material?

A. The --

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: I wouldn't say I

didn't review it. In fact, I -- I -- I read quite a bit of it, because I had to to keep finding the animal -- this -- these files weren't well organized, they weren't chronological, so I had to look at everything in there. But as it forged off into areas that were nonanimal, there was so much animal work to be done that I concentrated on that, but I looked at -- I have seen those other documents, I have read them, but I didn't go into them in any depth.

BY MR. HUTTON:

Q. Share with us what you recollect as to any human-based research that was done by MAI funded by CTR.

A. Basically, at MI -- MAI at the time, CTR was funding a variety of studies there, and Hubner from the Cancer Institute was also funding studies, and Hubner was on the CTR Board or on the CTR Scientific Advisory Panel at the time, as well. So, sometimes I'm not really certain who was funding what, but they had a -- they were working on -- and as part of developing any animal model, you definitely have to look at the human data, because that's what

you're modeling for, and they were -- they were looking at various aspects of what they knew about humans at the time and comparing it to their rodent models.

And I believe as part of that, then, other studies were done -- I'm not certain if they were funded by CTR or the Cancer Institute or both simultaneously -- to look into human aspects of it. But as I have said, when it got to that point where I knew we were not talking about the animal model, at that point, I didn't go into it any deeper than that.

Q. And I believe your review of the MAI inhalation study revealed that there were not any positive results; is that correct?

MR. ALLINDER: Object to form.

BY MR. HUTTON:

Q. Positive results are results -- results meaning that they didn't show that there was the induction of lung cancer in mice?

A. It's --

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: It's hard to answer that question, because you said the "inhalation

study," and there were a large number of studies. The -- the long-term study, the lifetime study, it's my opinion that that study is negative.

BY MR. HUTTON:

Q. Yeah. Thank you. Now, let me get right into the lifetime inhalation study, the project that you are referencing in your expert disclosure statement.

A. Uh-huh.

Q. That, I believe you -- you have documented, did not produce positive results; correct?

A. That's my opinion, yes.

Q. And from --

A. Now, let me preface that a little bit in that there are some positive -- there are results in there. There was an increased number of tumors in other sites. There were decreased numbers of tumor -- you know, there are some results, but if we're talking about lung cancer, that was negative.

Q. What other sites other than the lung yielded positive results?

A. There was an increased number of tumors on

the skin of the -- the animals relating to the -- being abraded by the smoking apparatus, and I forget which tumors -- there were some tumors that were -- there was a -- a statistically reduced number of tumors in the smoke animals. So, people generally look at which tumors were increased and don't look at the ones that were decreased, but there was a decrease in certain tumors that was statistically significant, but it's not an important finding. Neither of those are important findings.

Q. Yeah, but you're not inferring from that that the inhalation of smoke in that study actually was an anti-tumor or anti-cancer agent, are you?

A. In -- whenever you test chemicals, it's very common to find that -- that some chemicals cause reduced numbers of tumors, and people don't usually interpret that either way, but it does, in fact, occur, and it did, in fact, occur in this case. And generally, people don't view that as an -- real -- but it does happen commonly in these kinds of studies.

And no one knows -- we don't know the mechanism of the -- the ones that are

increased, so we certainly don't know the mechanisms of the ones that are decreased, but people then study that, because it may be an important clue to finding something that will affect the reduction of cancer. So --

Q. So, what's interesting about this lifetime inhalation study was not only did it yield negative results regarding lung cancer, it actually reduced the number of tumors --

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. -- in other locations?

A. That's --

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: That's my recollection today, but I'd have to look at that data more carefully, but that's how I remember it, that there is a -- there is another tumor type that was reduced, but that's very common in these kinds of studies.

BY MR. HUTTON:

Q. It would be absolutely ridiculous, would it not be, to extrapolate that the animal data research to suggest that it's safe to smoke

cigarettes because you won't get lung cancer, and on the other hand, if you got a tumor in the pancreas or in the esophagus, if you smoke, it may actually reduce the size of that tumor or eradicate that tumor; is -- would that be ridiculous?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't know that that would be ridiculous, because, in fact, if you had enough evidence that that was, in fact, the case -- most -- most compounds that cause cancer -- I mean, most compounds that are used to treat cancer also cause cancer. So, many of the compounds that are frequently used to treat cancer cause cancer as well in other sites. So, that's a common thing, that any chemical can have one effect in one area of the body and have a totally different effect in another area of the body, and we don't understand either of those mechanisms well enough.

So, I don't think it would be -- it would seem ridiculous to anyone. In fact, in this case, these mice, the smoking animals got less cancer than the animals that got -- that were sitting as the shelf controls that had no

cancer. So, it would be ridiculous to interpret that smoking caused less cancer, but, in fact, in these experiments, that was, in fact, the case.

BY MR. HUTTON:

Q. Doesn't that experience and phenomena that you just talked about perhaps tell you that there was something inherently suspect and wrong with this study?

A. Not at all. In fact, we are now in my area of expertise, and -- and these studies were very well designed, were very well conducted, and they were excellent studies.

Q. Well, if --

A. And so, the results are -- are interpretable to anyone who's experienced in these matters. So, it's really an excellent study.

Q. Well, let me give you an example. If I did a study, and I said, "I can conclusively prove that the earth is flat. I" -- "I have this well-designed protocol. I'm using the best equipments money can buy, and I can prove that the earth is flat," now, you would say, "I'm sorry. As well intentioned as

you are, despite as much money and time was spent, the earth is not flat, and there must be something wrong with that research," would you not say that?

MR. ALLINDER: Object to the form.

THE WITNESS: If I had other evidence to prove you were wrong, but actually, at one period in our history, the majority of scientists believed the world was flat. So, as more evidence was -- came about, it was proven otherwise, but I don't know where this relates to a mouse inhalation study. This was a state of the art -- better than a state of the art, because we were doing comparable studies at the Cancer Institute at the same time that weren't nearly as good as this study. It's the best that can be done.

BY MR. HUTTON:

Q. You believe, do you not, that this lifetime inhalation study was a justification for the cigarette companies to continue to publicly state that cigarettes don't cause cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't know what the

cigarette companies were or are publicly stating, and I don't think anybody was using this particular study as the only thing to make any kind of decision. There were thousands of other studies going on at the same time. So, this is only one piece of evidence, but it's a convincing one, because this was a very well-designed rodent study, which is what people try to do in the area of carcinogenesis.

So, it's an important study, but I think if you're going to make any kind of determination, you look at all the data available at the time. The other studies with animals were also negative.

BY MR. HUTTON:

Q. Now, what was the genetic makeup of the animals that were used in this lifetime inhalation study?

MR. ALLINDER: Still talking about MAI CTR?

MR. HUTTON: Yeah.

BY MR. HUTTON:

Q. From here on out, why don't you just assume that it's the MAI study funded by CTR, and we're talking about the lifetime inhalation

study.
A. Okay. This was a cross of two inbred strains of mice, and so, it's a -- a very defined genetic makeup, and I don't know how much detail you want me to go into. People frequently used at this time crosses -- use an inbred strain of mice, because you're trying to reduce the genetic variability, and then you use a cross because you want to increase that variability somewhat but still have a very defined mouse.
Q. From your experience in doing animal research, you know that you can genetically manipulate certain animals before a research project is done that will guarantee that that animal will never get cancer?
MR. ALLINDER: Object to the form.
BY MR. HUTTON:
Q. You know that can happen?
MR. ALLINDER: Same objection.
THE WITNESS: You -- you really can't. If you have done the experiment before, and you know with a specific mouse and you know with a specific compound, and you have got enough tests that it's always been negative, and

you can pick that mouse again and you might get a negative, but you can't, on the -- on the front end of this kind of study, pick a mouse that you could guarantee would be negative.

And, in fact, that's one of the things I looked for as I'm analyzing this, is, "Which mouse did they pick and why?" And they had gone through a large number of strains of mice, and I kept looking to see which mouse would they pick, because if you were trying to get a known negative, you would not have picked this mouse. They picked the mouse -- and, in fact, the authors of this paper are claiming in some other things that I have read that they still think this is a positive study. So, they believe they have even caused a positive study themselves.

MR. ALLINDER: And who are those authors?

THE WITNESS: Kouri and Henry, the authors of this study, published in the JNCI that this was pos -- a positive study. I don't agree with that interpretation, but nevertheless, it was their intent and it was -- I looked carefully -- that's one of the things I

look for, is -- is, "What are you trying to do? How are you doing it?"

Now, you could argue that -- and there is an argument among scientists of which mouse to use. Some would argue that you should use a mouse that doesn't get cancer easily to test a carcinogen, but they didn't pick such a mouse. They picked a mouse that was -- it appeared to me, from the data that they had already published, that they picked the mouse most likely to get cancer.

So, they were definitely trying to -- and that would have been a criticism. If this study had been a -- a strong positive, people who -- who didn't believe it would be on the mode of, "Well, you picked a mouse that was too susceptible to lung cancer," but they picked a mouse -- based on everything I saw in both their documents and the CTR documents, they were attempting to produce a positive model.

MR. HUTTON: Let's take a four-minute break.

VIDEOGRAPHER: Off the record at 10:26.

(RECESS TAKEN)

VIDEOGRAPHER: We're back on record at 10:35.

BY MR. HUTTON:

Q. What is the best animal model you know of that one should use to investigate the biological effects of a substance which may have adverse effects on animals?

A. That -- that's a long -- that could be a long answer, because there are a number of models, but in general, in the area of -- of carcinogenesis testing, the model that's used -- and at that time was used quite extensively, and even today is used quite extensively -- is the mouse, and that's because it has a number of features that make it more usable.

But ideally, what you'd like to have is a variety of models in a variety of species that all give you the same answer before you'd feel comfortable extrapolating that, because to extrapolate even between mice and rats is dangerous, because there are many chemicals that cause cancer in mice that don't even cause cancer in rats. And so, how can you possibly extrapolate that to humans, although the mouse may be more like the human than the rat. So,

it's a -- a long -- and unless you want to ask me a more specific question, it's a -- that's a big area.

Q. Probably a subject matter of a dissertation.

A. Well, and it's -- it's argued.

Q. Let me get into other species. We talked about -- or other species that one would want to use or look at before you make any extrapolation. Other species would include hamsters, guinea pigs, monkeys, rats among other animals, is that correct?

A. It could include those, but, in fact, most chemicals are tested in mice and rats, and then, pharmaceuticals are tested in one other -- in a nonrodent species. Some of those that you have mentioned, guinea pigs and hamsters and those, aren't frequently used, because there's real problems with using those. So, most of the technology and most of the work has been developed using mice and rats.

Q. The -- the lifetime inhalation study that we have been talking about, to your knowledge, was that done only on mice?

A. Yes, it was. They did a thorough review of

all the available models at the time, and the -- the scientists and the -- the contract lab, MAI, was kind of one of the world's authorities at the time on models, and they selected this mouse based on their analysis of all the models that were available at the time.

Q. Because it was only done on mice and not on rats or any other animal species, wouldn't you agree that one must be very careful and cautious to draw any major conclusions or extrapolations from that single species animal model test?

A. That's -- that's part -- partially true. Let me put it this way. It's definitely a very well-done negative mouse study, but you'd also like to have a rat study and a primate study. And -- and so, you never would take an individual study and -- and draw a major conclusion, other than this study definitely shows that the mouse model is negative.

Q. You would feel more comfortable, would you not, to be able to draw better conclusions, safer conclusions if there was also a rat and a primate study that had been done similarly?

MR. ALLINDER: Object to the form.

THE WITNESS: It's -- with any testing of any compound, the more species you can test, the better, and generally, though, you -- you pick primate as one of your examples. It would be outstanding to have lots of good primate studies with lots of compounds, but those are almost impossible studies to do, and the mouse and rat are picked because of their short life span. Any animal that has a long life span, it becomes very difficult to do a good study.

But yes, any time you have more data and more animals, it would be good to have many other species -- many other strains and stocks of mice so you would know -- right now, you know that this is a negative study, and one cross of two strains of mice, and that doesn't even mean that it -- you'd get the same results in other mice.

BY MR. HUTTON:

Q. But knowing you may get different results in -- in a different strain or different stalk of mice, knowing you may get a different result with rats, one must be cautious before

they draw too much comfort in the conclusions of this MAI inhalation study; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, other than I think you can be confident that this -- this test is negative, and that gives you much different information than if it were a strong positive, but you always have to be cautious unless -- until you have more information.

BY MR. HUTTON:

Q. I think you're saying one would be comfortable that this result is negative?

A. Well, having a -- a -- a well done study that's negative is very important information on any compound.

Q. It's one --

A. But it's not complete information until you have more -- other studies to -- to compare it to.

Q. It's a very small piece of the puzzle; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, "small" would be a debatable term. It's a very important experiment, and -- and if -- the quality of it

is why it's so important, because generally when you have a negative study, people ignore that information. It's harder to prove a negative than it is to prove a positive.

BY MR. HUTTON:

Q. Well, I --

A. And so, to have a strong, well-done negative study is an important part -- and I don't know how -- whether that's a big or small piece of that puzzle, but it's an important piece of it. You can't -- you can't finish the puzzle until you get some of these pieces.

Q. Have you, through your experience in doing animal research, seen other situations where all the animal data, the test results, for whatever reason, came back with negative results, but decades later, it was proven that, for whatever reason, the animal research was unreliable and that the human experience was absolutely to the contrary?

MR. ALLINDER: Object to the form.

THE WITNESS: If you say have I ever -- I can't think of -- but I'm sure there probably are such examples. It may be in 50 years, everything that we believe in science may

be proven wrong, because if you look back 50 years, almost everything scientists believed 50 years ago, we have proven a lot of those things are wrong. So, I'm certain there are examples. We have examples. I can't think of the exact compounds, but you can test a compound over and over again and get different results.

So, there are -- there's so many variables in these experiments that there -- there really aren't absolutes, but what you look at is -- and in this experiment, it's very useful -- is they used a very large number of animals. They did some things that make this a much better study compared to the other studies I have just referred to. The studies we were doing at the Cancer Institute, for example, we only had 50 animals per group.

So, when we came up with a result, it was much less reliable than -- than this study, because of the large numbers they used.

BY MR. HUTTON:

Q. Sometimes you scientists will respectfully disagree among yourselves or among your -- other scientists; is that correct?

A. We almost always disagree.

Q. Disagree?
A. So, that's part of science --
Q. Science?
A. -- is we're always disagreeing with each other and trying to prove which one of us has the right answer. So, that's a very common part of science.
Q. And likewise, with this MAI inhalation study, there's other scientists that have come to a different conclusion than you insofar as interpreting the data; is that correct?
MR. ALLINDER: Object to the form.
THE WITNESS: That's correct, including apparently the two authors of this study, although at the time, it appears they thought it was negative. They now are saying it's positive. So, it's --
BY MR. HUTTON:
Q. So -- I'm sorry.
A. It's -- this study is -- in a sense, it doesn't matter whether it's positive or negative, because if it is -- if we assume that the -- that they're right and this is a positive study, it's marginal and could never be used --

the study was intended to provide a model, and this would not be a good model even if it proved to be positive. But I do not believe, and I think there's sufficient data there to overwhelmingly convince the majority of scientists that this is a negative study.

Q. If it's not a good model, if the results were positive, likewise, it would not be a model if the results were negative; do you agree?

MR. ALLINDER: Object to the form.

THE WITNESS: In general, no model can be used as a model when it's negative, because what you're using the model for is to study the mechanism. So, you'd do other things to it. So, if you had a negative, you wouldn't do those further studies, because you're not getting anywhere.

So, I may be using model in a different sense than you are. It is a good -- it can be used as a negative piece of data to show that -- that a well-done smoke inhalation study in this strain of mouse is negative, but a model would be used more for further studies where you'd change things to try to determine

why is it -- why is it positive, and you wouldn't do that with a negative study.

BY MR. HUTTON:

Q. This inhalation study did not address the issue of whether the chronic inhalation can cause emphysema; is that correct?

A. It did not.

Q. It did not address the issue of whether chronic inhalation of cigarette smoking can cause cancer to other organs; correct?

MR. ALLINDER: Object to the form.

THE WITNESS: They did look at a large number of other tissues and organs, and they did enumerate any cancers that occurred, but the thrust and the intent from the beginning of this study was to attempt to develop a lung cancer model in a mouse.

And so -- but I -- I think you could say that they did look at a large number of other tissues and they did look for other tumors, and they did enumerate those tumors in the report, but that was not the thrust of the -- of the experiment.

BY MR. HUTTON:

Q. Do you have an opinion as to whether

or not chronic cigarette smoking can induce any biological activity within the human body?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, it induces all kinds of biological activities within the body. That's not my area of expertise, but just, you know, I have smoked a few -- I say I'm not a smoker, but I have smoked a few, and a lot of things happen when you inhale cigarettes.

BY MR. HUTTON:

Q Give me your understanding whether -- as a scientist or personally, as to what type of biological activity is induced by cigarette smoking.

MR. ALLINDER: Object to the form.

THE WITNESS: Again, it's not my area of expertise, but you -- you absorb a lot of different chemicals, nicotine being one of them. It then goes through -- there is pharmacokinetics which are changed by whatever you're taking into your body. So, just like when you eat lunch or do these other activities, you -- a lot of biological things happen in your body.

//

BY MR. HUTTON:

Q. There is no question that you are putting into your body a known carcinogen, but the point you have tried to make is yes, it's a known carcinogen, chronic cigarette smoking, it's just that you don't think that it results in the individual getting cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, what's very important, as a toxicologist, we try to teach people about the concept of dose, and so, every day we're all exposed to a large number of carcinogens, but it's the dose that's important, and -- and if you don't get to a high enough dose, it may have no effect on you at all.

Now, and that's shown in the animal experimentation. At very low doses of carcinogens, we can't cause cancer in any of these models. We have to go to very high doses before we can cause cancer in any of these models, and there's very few chemicals that will cause cancer at real low doses in any animal. So, the dose is real important, and we don't -- the other problem is we don't understand very much about mixtures, either.

And so, it depends -- there's lots of factors that occur when you ingest a carcinogen. So, every one of us ingests hundreds of carcinogens every day, and most of us don't get cancer, because the dose is too low or there is some other protective mechanism in your individual body that keeps you from getting a tumor.

BY MR. HUTTON:

Q. Aren't there scientists, aren't there physicians that believe there is a dose response relationship between chronic cigarette smoking and cancer?

A. There -- there has been shown, in fact, that the people who get cancer are the people who smoke three or four packs a day. So, there does appear to be a dose response relationship in those people who get cancer, and that's pretty well accepted. The people that smoke a few cigarettes are very unlikely to get cancer.

Q. Do you know Harmon McAllister?

A. I -- I don't know him personally. I know of him and I have -- I've read information about him.

Q. Well, I believe he is the Scientific

Director for CTR; does that refresh your recollection?

A. I -- I think that's his title.

MR. ALLINDER: The current one?

THE WITNESS: He's currently there.

BY MR. HUTTON:

Q. Currently? I thought you said Colonel.

MR. ALLINDER: No. I'm sorry. I meant to say -- I meant to say current. I was clarifying your question. You were asking him whether he is the current Scientific Director, and his answer was yes. There have been others.

MR. HUTTON: I believe it's H-A-R-M-O-N, and the last name M-C-A-L-L-I-S-T-E-R.

MR. ALLINDER: I believe that's correct.

BY MR. HUTTON:

Q. I can tell you that -- on information and belief that he testified recently in a cigarette case in Florida in response to a question as to quote, "Does cigarette smoking cause lung cancer?" -- or strike that. The question was, "Does cigarette

smoking cause lung cancer or doesn't it?" and his answer was, quote, "In the epidemiologist's framework, sure." "In the common everyday terms, does smoking cause cancer not thinking of it scientifically, you can accept that?" "Yes, it does. There's no doubt that the association is very strong, the public health measures need to be taken."

Assume that, in essence, is the testimony regarding causality between smoking and lung cancer, the testimony of the Scientific Director for CTR, the question I have to you, sir, is: Do you agree with that testimony.

MR. ALLINDER: Object to the form.

THE WITNESS: I'm essentially saying the same thing. I'm saying it, though, in a way that I am -- I have a harder time -- it's harder for me to use a word in two different ways, just because one is the common use and the other is the scientific use, but I'm saying essentially the same thing, that there is an association, there is a dose response, but when you start talking causality, I need -- I use that term in a more precise way.

Q. Your use --

A. And to just say, "Well, it's okay for the Surgeon General to use it another way," I can say that, but I think that's subject to a lot of misinterpretation.

Q. I don't want to repeat what we have discussed this morning, but the problem you have on the scientific point of view is the absence of the mechanism being explained; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: That's -- that -- if we knew the mechanism, it would help me, but the real problem I have with it is the very large number of people who smoke very large numbers of cigarettes who get no cancer and the people who don't smoke who get cancer.

And so, I realize there are many risk factors, and the combination of risk factors, definitely cigarette smoking is a -- an important one and a strong one, but we don't know what really causes cancer. It -- you could get cancer without ever smoking a cigarette, and you could smoke a lot of cigarettes and never get cancer. So, that's where I have the problem, and including the numbers of people

that get cancer compared to the -- the numbers of people that smoke are quite small.

BY MR. HUTTON:

Q. Are you telling us that the number of people that get adenocarcinoma -- the number of people that get adenocarcinoma is -- and smoke is quite small compared to the people that don't smoke and get adenocarcinoma?

MR. ALLINDER: Object to the form.

THE WITNESS: I have never really looked at the data to see which of them are getting which type of cancer, so -- but I know that the total number of people getting cancer total, including all the different tumor types, is -- is -- is a fairly small number compared to the total number of smokers.

BY MR. HUTTON:

Q. But to challenge, if I might, your last thought regarding that the majority of the people who get cancer don't smoke, if we talk about lung cancer and we limit that discussion of lung cancer to art adenocarcinoma -- adenocarcinoma, and if you assume that the majority of the people that get adenocarcinoma of the lung are chronic smokers, that kind of

refutes the proposition that you were making that most of the people that get cancer don't smoke, does it not?

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: It's not my area of expertise, but we don't really even know what the incidence of adenocarcinoma in nonsmokers is. The majority of people are not autopsied. So, we don't really even know what the baseline for most of these tumors really is.

And so, someone who smokes and someone who's been sick and someone who is being treated for lung cancer is autopsied, and so, we have a fairly good idea of that number, but we really don't know the number for how many people have adenocarcinoma that we never even knew they had it

BY MR. HUTTON:

Q. But, Doctor, you can diagnose adenocarcinoma without doing an autopsy. It's done every day, is it not?

MR. ALLINDER: Object to the form.

THE WITNESS: You can if you're looking for it, and -- but there are probably

many people dying of tumors that are dying of other conditions that may have these tumors and that are not autopsied.

MR. ALLINDER: Excuse me. Mark, your earlier question, I think you misunderstood his testimony. You seem to be operating on the premise that he has said that the majority of people who get lung cancer are nonsmokers, and I don't think that was his answer, and you might want to clarify that, because that may be the cause of your puzzlement that leads to the subject of questions.

THE WITNESS: I -- I'm sorry if I -- if I said that or --

MR. ALLINDER: Well, let him ask the question if he wants to clarify it.

MR. HUTTON: I may get into that in a different way. I'll come back to that.

MR. ALLINDER: I just thought you misunderstood his testimony before.

MR. HUTTON: Well, oh, just a country bumpkin here trying to pick up a few extra acorns here, and I misunderstand a lot.

MR. ALLINDER: I'll give you a new expression for that on break.

(DISCUSSION OFF THE RECORD)

BY MR. HUTTON:

Q. Let's shift into a different subject matter; fair enough?

A. Okay.

Q. Let me get into some literature here, and I want to find out what you know and what you don't know, what you've read and what you haven't read, what has been given to you by Shook, Hardy & Bacon and what has not been given to you by Shook, Hardy & Bacon. That's where I'm coming from; fair enough?

A. That's fine.

Q. All right. I never sneak up on anybody. I forewarn you, and I'll head down that direction here.

MR. HUTTON: Let me hand you an exhibit here, and I apologize. I only have one. But this is -- and --

MR. ALLINDER: You want this marked?

MR. HUTTON: Marked as Exhibit Number 2.

(EXHIBIT NUMBER 2 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. ALLINDER: Mark, is this the

whole --

MR. HUTTON: Yes.

MR. ALLINDER: The whole article or the whole journal issue?

MR. HUTTON: As it relates to smoking. I assume we cut out the ads. This entire thing was devoted to smoking.

MR. ALLINDER: Okay. I'm not going to go through all of this now, but it's a good portion of that issue.

BY MR. HUTTON:

Q. Doctor, in front of you is Exhibit Number 2 that has been marked as an exhibit. It is the Journal of the American Medical Association dated July 19th, 1995. You have heard of the Journal of the American Medical Association, have you not?

A. Yes, I have.

Q. It is the official Journal of the American Medical Association; is that correct?

A. That's correct. They may have more than one, but this is their main one.

Q. I believe that the entire journal was devoted to cigarette issues, and that will be reflected in the table of contents here.

Initially, my question to you is: Have you read this journal, Exhibit Number 2?

A. I have read the part about tobacco. There are some other things in this edition.

Q. Which part have you read?

A. I have read from page 219 to the end of the editorial which starts on page 256.

Q. Okay. So, you're saying that the part of this journal, if not the entire journal, that is devoted to cigarettes, you have read?

A. That's correct. There is some -- I just was referring to -- I'm real literal, and there is other things in here besides tobacco. So, the "Physiology of Sleep" and "Poetry" -- called "Keeping Dry" and other things.

Q. Yes. But --

A. And I didn't read those.

Q. -- 90 percent of this or 95 percent is devoted to the cigarette issue; is that correct?

A. It appears that way. I don't know the exact percentage, but quite a bit of it is devoted to that.

Q. Do you recall the section in there that discussed a tobacco lawyer by the name of

David Hardy?

A. I don't remember this -- it has been some time since I read this. So, I don't remember, but I have seen him -- his name in a lot of things that I have looked at.

Q. Now, who is David Hardy?

A. He was, I guess, a partner of Shook, Hardy & Bacon; is that --

Q. Is he a partner?

A. He's a Hardy. I don't know whether he was the Hardy of Shook, Hardy & Bacon.

Q. Assume that he was. He would be the partner of the gentleman sitting next to you, or --

MR. HUTTON: Is he still alive?

MR. ALLINDER: It depends on which David Hardy you're asking about.

MR. HUTTON: The old man.

MR. ALLINDER: But I'm not testifying.

MR. HUTTON: I know.

THE WITNESS: I don't even know if he is a partner, but he's a member of Shook, Hardy & Bacon in some capacity.

MR. ALLINDER: And the "he" is

referring to me, Bill Allinder.
BY MR. HUTTON:
Q. But, nonetheless, I guess the point I'm making is the Shook Hardy & Bacon law firm that has hired you as a consultant that has identified you as an expert in this case is the same Shook, Hardy & Bacon law firm that is mentioned and discussed in this journal; is that correct?
A. I believe that to be true.
Q. Although the law firm may have had a different name at the time in this article, it was Shook, Hardy and something else?
A. I don't remember that, but it's possible.
Q. Nevertheless, it's the same law firm?
A. (Witness nods head.)
Q. In -- have you written an article on cigarette smoking?
A. No.
Q. Have you written an abstract on cigarette smoking or any issues dealing with the -- the issues of tobacco and cancer?
A. No.
Q. So, what you know about tobacco and

cigarette smoking is limited to what you have read, whether it's the research done by MAI or the medical literature given to you by Shook, Hardy & Bacon; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: Not completely in that, as a scientist, I have worked in the area of carcinogenesis for many years. And so, I have read other articles, including some of the articles that are in the two note -- so-called two notebooks that I have. Many of those articles were -- I had prior to even beginning to work for Shook, Hardy.

But I have definitely looked more closely at this issue since working for them, because my area of -- of research and expertise -- I wasn't working directly in the area of tobacco smoke, but I was working in the area of carcinogenesis. I may have tested compounds that are in tobacco smoke -- I have never looked through to see. I may have tested, but it never was in the context of being related directly to tobacco smoke.

BY MR. HUTTON:

Q. If you will turn to page 225, sir --

A. (Witness complies.)

Q. -- the title of that is, "Nicotine and Addiction," is it not?

A. It is.

Q. I'm going to just read a couple of sentences and see if you agree or disagree. Quote -- first sentence, quote, "Of the thousands of chemicals in tobacco smoke, nicotine may be the most important." Do you agree with that?

A. "May be" --

MR. ALLINDER: Object to the form.

THE WITNESS: "May be" makes it totally agreeable, because "may be" is so nonspecific. So, I don't see how anybody could object to that, because it may be, but it may also -- might not be.

BY MR. HUTTON:

Q. "Nicotine" -- next sentence, "Nicotine makes tobacco addictive and largely explains why people use tobacco products."

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. Do you have any reason to disagree with that statement?

MR. ALLINDER: Object to the form.

THE WITNESS: It's -- it's --

MR. ALLINDER: Excuse me. May I ask a question? Mark, Dr. Hamm has testified earlier that he has no expert opinion on this particular topic. So, I assume your questions to him right now, you're asking about his views and not asking specifically as to whether he has an expert opinion on the questions that you're now posing?

MR. HUTTON: Yes. I'm asking just from his work in this area and as a scientist, and he has already identified what he feels like he's an expert or not an expert in.

THE WITNESS: I'm really not an expert on this, but I -- my view of it is, is that nicotine is -- is -- probably at least habituates people. I don't know the exact term of whether "addictive" is -- is the correct term to use or not, but definitely, like the Nicoderm patches and these kinds of things are used by people to -- to stop smoking, and so, there has to be some kind of an association there.

There could be many other things that people -- we know that all these compounds

in the tobacco may do a number of things in the body, and it could be something else in there is important as well, but definitely, it appears that nicotine is an important component of why people like to smoke, and I think most people agree with that.

BY MR. HUTTON:

Q. And then, the next sentence -- before I move on to something else -- states, quote, "The addictiveness of nicotine keeps people smoking long enough and heavily enough for tobacco smoke to cause serious illness and death." You most certainly agree with that, do you not?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: Well, I have the same -- it's not my area of expertise, and I -- I still don't know whether "addictive" is the correct terminology to use for what occurs with people that -- that are tobacco smokers.

BY MR. HUTTON:

Q. But it goes on and states that people long and -- people smoke heavily enough for tobacco smoke to cause serious illness and

death. That part of the sentence you certainly agree with, do you not?

MR. ALLINDER: Object to the form.

THE WITNESS: Again, I don't know what all the things are people like about smoking, and it can't be just nicotine, because when people do things like Nicoderm patches, they don't do them for the rest of their life. So, there's more to it simply than the nicotine, and there's flavor -- there's other things going on.

So, I think to blame it all on nicotine may be exaggerating it a little bit, but I don't know. This isn't my area of expertise. I don't know how much work has been done to really know these things, and it isn't my area of expertise.

BY MR. BUTTON:

Q. Well, these authors that got this article published in this medical journal -- which is the official medical journal on behalf of the thousands of physicians in the country. The American Medical Association, this is the official journal on behalf of thousands of physicians, and when they put in writing here

that tobacco smoke causes serious illness and death, you would have to defer, would you not, to that statement as truly reflecting the consensus of how the medical community feels about the relationship between smoking and serious illness and death, would you not?

MR. ALLINDER: Object to the form.

THE WITNESS: No, I wouldn't. This is written by John Slade, Lisa Bero, Peter Hanauer, Deborah Barnes and Stanton Glantz, and those people, this was their view, and they were willing to put their name on it. This then went through a process -- I don't know if this even went through a process of peer review, because this is a special set of articles.

So, I don't know who else, if anybody, reviewed it, and definitely the majority of -- of physicians had no -- no part in the review. So, this is the view of the -- whoever reviewed it plus these authors, but it doesn't necessarily represent the rest of the people. They would have to, if they disagreed with it, write letters to the editor or -- if they felt so involved.

BY MR. HUTTON:

Q. This Stanton Glantz, the Ph.D. who is the last author, have you reviewed any of his work?

A. Sitting here today, I can't tell you precisely. I have looked at so many materials, but -- but I can't think of -- that I have.

Q. Have you been told by counsel that Dr. Stanton Glantz is one of the finest researchers in the world in the area of cigarette smoking and cancer?

MR. ALLINDER: Object to the form. Excuse me. Mark, I think that the position that has been taken by Plaintiffs' counsel in this case earlier, that they would not permit inquiry regarding communications or discussions between counsel and the expert witness, and I'm not going to tell Dr. Hamm not to answer the question. He can answer the question if he would like to, but again, I'm reserving our position with respect to this issue more generally.

MR. HUTTON: It's -- it's really an innocuous question.

MR. ALLINDER: It may be an innocuous question, but you know that it could

be important in other -- in other circumstances. And so, I make that reservation on the record.

MR. HUTTON: By allowing him to answer, you're not waiving any objection?

MR. ALLINDER: That is correct.

THE WITNESS: Sitting here today, I can't remember discussing the credentials of -- of Dr. Glantz, but that may have happened.

BY MR. HUTTON:

Q. When you read this -- strike that. How many times have you read this entire journal, the articles devoted to the issues of cigarette smoking?

MR. ALLINDER: And when you say, "this journal," we're talking about this issue?

MR. HUTTON: Exhibit Number 2, right.

THE WITNESS: I don't know precisely, but I would think not more than once or twice, and -- and I -- when I read anything, I don't focus on things that are not in my area of expertise.

BY MR. HUTTON:

Q. Was this --

A. And addiction definitely is not in my area

of expertise, so I didn't focus a lot on this.

Q. Was this journal given to you by Shook, Hardy & Bacon or was this something you had yourself pulled?

A. It was given to me by Shook, Hardy & Bacon. I don't remember whether I asked for it or they gave it to me without my asking for it. So, I don't keep records of that, and I have gotten so many documents now that I don't know which, but it may be -- they have told me on a number of occasions articles that are available and asked me which ones I would like to review. And I could have requested it that way, or they could have given it to me, but in either case, they're the ones that provided the copy that I have, and I did not read it at the time it came out in the journal. I didn't read it primarily as like going to the library and reading the journal.

VIDEOGRAPHER: I think this might be a good time to change the tape. This concludes tape number one of the Dr. Thomas Hamm, Jr. deposition. Time is 11:16.

(RECESS TAKEN)

VIDEOGRAPHER: This is tape number two of the Dr. Thomas Hamm, Jr. deposition. The

time is 11:24.

BY MR. HUTTON:

Q. I'm going to now hand you some abstracts of articles, and I believe the ones I will now hand you, sir, are of more recent vintage, hopefully abstracts that have been published of articles written and published in the last year or two.

MR. HUTTON: Exhibit Number --

MR. ALLINDER: Three.

MR. HUTTON: Let me stop here and have the Court Reporter -- why don't you pre-mark that.

(EXHIBIT NUMBER 3 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Let me hand you Exhibit Number 3, which is an abstract.

MR. ALLINDER: Let me note at this time that the exhibit that's marked that has been handed to Doctor Hamm has certain portions of it highlighted, and it may be that some of the other exhibits that are used will have highlighting on them, as well, that will show up in the original, but perhaps not in the copies.

BY MR. HUTTON:

Q. The article is entitled -- or the abstract is entitled, "Epidemiology of cancer by tobacco products and the significance of TSNA." What is TSNA, sir?

A. I'll have to look at the article. I don't offhand know.

Q. Let me see if I can help you out here. TSNA, I think it's, "Tobacco" --

A. "Tobacco-specific N-nitrosamines."

Q. Correct. Why don't you just read into the record what I have highlighted, if you would.

MR. ALLINDER: Object to the form.

THE WITNESS: You have highlighted the second -- part of the second sentence, which says, "Tobacco use is the most important risk factor for oral cancer" -- or all of the second sentence and then, "the most common form of tobacco use" -- did you mean to -- my -- my copy --

BY MR. HUTTON:

Q. Yes. Go ahead and continue.

A. Let me start over with the third sentence. "The most common form of tobacco use, cigarette

smoking, demonstrates a very high relative risk -- in a recent cohort study, (CPS II), even higher than lung cancer." And then, you have highlighted down towards the end of the abstract, "Collectively, the evidence fulfills the epidemiological criteria of causality; strength, consistency, temporality, and coherence. The biological plausibility is provided by the identification of several carcinogens in tobacco, the most abundant and strongest being tobacco-specific N-nitrosamines such as N-nitrosonornicotine(NNN) and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)."

Q. Have you written on the subject matter, Sir?

MR. ALLINDER: Object to the form.

THE WITNESS: Which subject matter are you referring to?

BY MR. HUTTON:

Q. TSNA?

A. I may have. I tested a large number of chemicals, and there may have been a nitrosamine in there, but I don't specifically remember such a -- and I have never worked specifically in the

area of oral cancer in any capacity.

Q. Have you read the underlying article?

A. Have I read the under --

Q. Well, this is the abstract, and assume that the abstract later resulted in the rendition of the actual article, the publication of the article. Have you read the article?

MR. ALLINDER: If it will help, there's a citation that's towards the top.

THE WITNESS: Yeah. It says, "Critical reviews in Toxicology." No, I haven't read this particular article. Well, I shouldn't say that. I may have read it. I have read so many articles that it's difficult for me to remember every one, but I don't specifically remember this article.

BY MR. HUTTON:

Q That abstract addressed oral cancer. Let me hand you an abstract that discusses a different type of cancer, that's bladder cancer.

(EXHIBIT NUMBER 4 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: Counsel can have the same objection regarding the highlight.

MR. ALLINDER: Thank you.
BY MR. HUTTON:
Q. Would you read into the record the highlight? I'm sorry. Exhibit Number 4, is that --
MR. EDWARDS: Uh-huh. That's right.
BY MR. HUTTON:
Q. Four is entitled "Epidemiology and etiology of bladder cancer"; is that correct.
A. That's correct.
Q. Read into the record the highlights, sir.
A. "The incidence" --
MR. ALLINDER: Object to the form. I'm sorry. Go ahead. Object to the form.
THE WITNESS: "The incidence of bladder cancer continues to increase with an estimated 53,000 new cases diagnosed in the United States in 1996-90% of which are transitional cell carcinomas. The male-to-female ratio is 3:1. A number" -- I don't know if the next sentence --
Q. "A" -- "A number."
A. -- is underlined.
Q. Okay. Well, read the next one.

It's "A" -- starts with "A" --

A. Mine is highlighted "A number of etiological factors are," and then it stops. That's what I was asking. Do you want that whole sentence? "Associated with the development of bladder cancer, but in industrialized countries, cigarette smoking is the most important."

Q. And the last sentence?

A. The last sentence says, "Bladder cancer is a potentially preventable disease with a significant morbidity and mortality in many parts of the world."

Q. It is potentially preventable because if one did not smoke cigarettes, one reduces the risk of bladder cancer; is that correct?

A. Yes, but --

MR. ALLINDER: Excuse me. Objection.

THE WITNESS: -- as it says in the highlighted part at the top, it says a number of etiologic factors are associated. So, that -- I'd have to read this more carefully to know. It may mean they -- they mean a number of

etiologic agents could be changed in some way.

Q. A number, however --

MR. ALLINDER: I have an objection to the form of the last question.

BY MR. HUTTON:

Q. A number of etiological factors may be associated, but they said the cigarette smoking is the most important factor, does it not?

A. That's what it says.

Q. And "etiological" means what?

A. That "etiology" means what causes it.

Q. Causes. Yeah. Now we'll go from bladder cancer to cervical cancer.

(EXHIBIT NUMBER 5 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Exhibit Number 5 is entitled "Case-control study of risk factors for cervical squamous cell neoplasia in Denmark. IV: Role of smoking habits." It's a 1996 article. Would you -- this is an abstract that is discussing the risk factors for cervical neoplasia; is that correct?

A. That's what it says.

Q. And they're talking about cervical squamous-cell carcinoma in situ, are they not?
A. That's what it says.
Q. The cervix is the -- is the tip of a woman's uterus, is it not?
A. That's correct. It's the opening.
Q. Opening.
A. And the surrounding -- the tissue surrounding the opening.
Q. It states in part, "Current cigarette smoking was found to be significantly associated with the cervical squamous cell carcinoma in situ," and they lay out the -- the relative risk and the confidence interval, and then it states, "A" -- quote, "A dose-response relationship was present, especially for number of cigarettes smoked per day. The results of the present study support the hypothesis implicating smoking as a risk factor for cervical squamous cell carcinoma in situ."
Did you know before reading this abstract that cigarettes now have been linked to cervical squamous-cell carcinoma?
MR. ALLINDER: Object to the form of the question.

THE WITNESS: There has been a linkage established or shown for a number of sites, and I haven't really focused on any other sites than those that are being put into animal models, and this is not a site that generally is studied in animal models, but -- so, to give you the list of all the sites that I knew about before reading a particular article, there have been -- for many years, there have been associations with other -- other sites.

(EXHIBIT NUMBER 6 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Exhibit Number 6 is entitled, "Paternal cigarette smoking and the risk of childhood cancer among the" -- "among offspring of nonsmoking mothers," published in the Journal of the National Cancer Institute. It's a 1997 abstract, or it was published in a 1997 article, and this is the abstract. The abstract is the summary of the article, is it not?

A. That's correct.

Q. And would you read into the record what I have highlighted?

MR. ALLINDER: Object to the form.

THE WITNESS: You have highlighted the first or second sentence after "RESULTS AND CONCLUSIONS." "Paternal preconception smoking" -- "paternal preconception smoking was related to a significantly elevated risk of childhood cancers, particularly acute leukemia and lymphoma. The risks rose with increasing pack-years of paternal preconception smoking for acute lymphocytic leukemia (ALL) (P for trend=. 01), lymphoma(P for trend=. 07), and total cancer (P for trend=. 006)."

BY MR. HUTTON:

Q. Okay. Paternal preconception would be the mother smoking before the child was born?

A. No. That's the father smoking.

Q. I'm sorry. The father. Paternal. So, the father --

A. I thought you were trying to trick me.

Q. You're listening to my questions. Good. I apologize for misstating. That -- let me see if we can kind of draw the inference or the conclusion that they're intimating here. Paternal preconception smoking. The father's smoking before the child is born; correct?

A. That's what it says.

Q. When the father smokes before the child is born, there is an elevated risk of the offspring, the child, developing acute leukemia and lymphoma; is that correct?

A. That's what it says.

MR. ALLINDER: Excuse me. Object to the form.

BY MR. HUTTON:

Q. So, those children that develop acute leukemia and lymphoma, according to this, in some cases may have developed those childhood cancers because the father was smoking; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: Yes. That's what this abstract says.

BY MR. HUTTON:

Q. Have you -- have you seen this type of research before?

A. I have seen this, because it has got a lot of attention. So, this was widely publicized as a paternal link. I'm not certain it was this exact paper. I don't know if there are other papers.

Q. Okay. That was -- that was abstract

regarding childhood cancers. Let's get into other areas where cigarette smoking seems to be associated with cancers.

(EXHIBIT NUMBER 7 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. ALLINDER: Thank you.

BY MR. HUTTON:

Q. Exhibit Number 7 is an article written or published in JAMA, J-A-M-A, the Journal of Medical Association, 1996. It is entitled, "A Prospective Study of Cigarette Smoking and Age Related Macular Degeneration in Women"; is that correct?

A. That's what it says.

Q. What is "Macular Degeneration"?

A. It's a degeneration of the -- the retina.

Q. Which eventually leads to blindness?

A. Leads to blindness.

Q. It's a pretty serious disease, isn't it?

A. Very serious.

Q. Very serious disease. And this was setting the relationship between smoking and women that develop age-related macular degeneration. Would you read into the record

the conclusion.

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: The conclusion says, "Cigarette smoking is an independent and avoidable risk factor for AMD among women. Because AMD is the most common cause of severe visual impairment among the elderly and treatment is not available or is ineffective for most patients, reducing the risk of this disease is another important reason to avoid smoking."

BY MR. HUTTON:

Q. So, an inference of this article is women who smoke, older women that smoke, may well become blind because of smoking; is that correct?

A. I'd have to read the whole paper, but that -- the part you have had me read makes that conclusion.

Q. We'll get into some abstracts regarding lung cancer, some more recent vintage abstracts.

MR. HUTTON: Let me hand you Exhibit Number 8.

(EXHIBIT NUMBER 8 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)
BY MR. HUTTON:
Q. And this is entitled "Risk of squamous cell carcinoma and adenocarcinoma of the lung in relation to lifetime filter cigarette smoking," and it is published in Cancer, 1997 -- August 1997. So, this, the article, is of very, very recent vintage, is it not?
A. It was published in August of 1997, and this is October of 1997.
Q. Have you read the article; do you recall?
A. I don't recall. This -- this -- I'm thinking this got fairly wide -- people talked about this one, as well, but I haven't read the original. I don't think I have read the original article, but I'm not certain of that.
Q. Okay. Why don't you read into the record what has been highlighted.
MR. ALLINDER: Object to the form.
THE WITNESS: It says, "Background: Over the past few decades, the incidence of adenocarcinoma (AC) of the lung increased much more rapidly than that of squamous cell

carcinoma (SCC) in men and women. During this time period, filter cigarettes with substantially reduced 'tar' and nicotine yields in the smoke came to dominate the market."

Then you skip to the last part of the abstract under "CONCLUSIONS," "Evidence that the increasing predominance of adenocarcin -- AC over SCC may be due in part to the reduced risk of SCC (but not AC) associated with lifelong filter cigarette smoking is strongest in women; for men, further studies that include larger numbers of lifetime filter smokers are needed to confirm this study" -- "this finding. A lack of protection against AC from low yield filter cigarettes may result from smokers' 'compensating' with deeper and more frequent inhalation, thereby increasing delivery of carcinogens to the peripheral lung. The smoke of modern cigarettes also contains higher concentrations of nitrosamines that primarily produce AC."

BY MR. HUTTON:

Q. Let me ask you the -- in the background section, they talk about filter cigarettes with substantially reduced tar and

nicotine yields in the smoke. Do you know what they're talking about there?

A. It's not my area of expertise, but using a filter, you can filter out a lot of the particulates, and that's the so-called tar. So, you're -- it's gas and tar.

Q. Is the tar the substance that, when inhaled, sticks to your lungs?

A. I don't know. Some, you know -- it's not my area of expertise. A lot of it gets stuck in your nose. It depends on how you smoke, and there's a whole variety of things here, and I don't know if stuck in your lungs, it's one of the compounds that reaches -- that can reach your lungs, depending on the size.

Q. Is the substance that's left over after the gas of the smoke is dissipated?

A. That's basically my understanding. That's -- if you get rid of the gas, what's left is the tar.

Q. Last sentence, "The smoke of modern cigarettes also contained higher concentrations of nitrosamines that primarily produce AC." That's the adenocarcinoma; correct?

MR. ALLINDER: Excuse me. Object to

the form.

THE WITNESS: That's what it says.

BY MR. HUTTON:

Q. So, smoke of cigarettes primarily produce adenocarcinoma; is that what they're saying?

MR. ALLINDER: Object to the form.

THE WITNESS: I'm sorry. Would you ask me that again?

BY MR. HUTTON:

Q. Well, the smoke of modern cigarettes primarily produce adenocarcinoma; that's what that last sentence says in part, does it not?

MR. ALLINDER: Object to the form.

THE WITNESS: No. The last sentence refers to the higher concentration of nitrosamines that primarily produce, is what it says.

BY MR. HUTTON:

Q. Right. But it's -- the higher concentrations that cause the individual to pro -- to contract adenocarcinoma; is that correct?

MR. ALLINDER: Object to the form.

THE WITNESS: It's the -- these authors believe that -- that's what they have

said.

MR. HUTTON: Let me hand you the next abstract.

(EXHIBIT NUMBER 9 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: Number 9 is entitled, "Impact of filter cigarette smoking on lung cancer histology." Another article published in 1997, July of 1997. Would you read into the record what I have highlighted, sir?

MR. ALLINDER: Object to the form.

THE WITNESS: You highlighted the first sentence after background, which says, "The rates of lung adenocarcinoma cancer have risen more rapidly than the rates of lung squamous cell cancer over the past two decades.

METHODS: A case-control study" -- you maybe didn't mean to --

BY MR. HUTTON:

Q. You can go ahead and read the methods.

A. "METHODS: A case-control study was carried out to assess the impact of long-term filter cigarette smoking on the risk of squamous cell carcinoma and adenocarcinoma of the lung."

Q. And the conclusion?
A. And the final sentence is -- highlighted is "The predominance of AC over SCC may be due in part to the fact that smokers of very low yield cigarettes tend to compensate for the lower nicotine levels by inhaling more deeply and frequently, leading to greater exposure of the peripheral lung to the carcinogens in tobacco smoke, and in part to the increased concentration of nitrosamines that preferentially produce AC in laboratory animals."
Q. Have you read this article, the underlying article?
A. I can't say for sure, but I don't, sitting here today, have a recollection of reading this particular article.
Q. It suggests that in laboratory animals, they were able to produce adenocarcinoma, were they not?
A. Actually, that statement is one that would make you want to read this more carefully, because generally, laboratory animals generally get adenocarcinomas and don't get squamous cell carcinomas. So, to say nitrosamines

preferentially produce that is kind of a debatable statement, because most carcinogens only produce adenocarcinomas in laboratory animals.

MR. HUTTON: Let me hand you Exhibit Number 10.

(EXHIBIT NUMBER 10 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. And this is entitled "Cigarette smoking and large cell carcinoma of the lung." It's another article that was published in 1997, and would you read what I have highlighted into the record, sir?

A. You have highlighted the last sentence, which says, "The present case-control investigation demonstrates that the risk of large cell cancer increases with both the frequency and number of years of cigarette smoking. The odds ratio associated with smoking two or more packs per day was 37.0 (95% confidence interval, 16.4-83.2) in men, and 72.9 (35.4-150.2) in women. It is concluded that cigarette smoking is the predominant cause of large cell lung cancer."

Q. Do you -- do you agree that cigarette smoking is the predominant cause of large cell lung cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: It's not my area of expertise, and I don't have any way of knowing what causes large cell lung cancer.

BY MR. HUTTON:

Q. Nonetheless --

A. This is an epidemiological study that shows there is -- in this study, an association.

Q. Well, they don't say an association. I think the last sentence says, "It is concluded that cigarette smoking is the predominant cause of large cell lung cancer." Did I read that correctly?

MR. ALLINDER: Object to the form.

THE WITNESS: You did, and that's the opinion of Muscat, Stellman, Zhang, Neugut and Wynder, and whoever reviewed this allowed that terminology to be used.

BY MR. HUTTON:

Q. And they used the word "predominant cause." They don't use the word "association," do they?

A. That's the words they used, but what they have done is an epidemiological study. So, all they can have is an association. There may be many factors they didn't even study.

Q. Doctor, an epidemiology can prove probable causation, can it not?

MR. ALLINDER: Object to the form.

BY MR. HUTTON:

Q. Probable causality?

MR. ALLINDER: Same objection.

THE WITNESS: We're getting into, again, your definition and my definition, but "probable causality" is different than "predominant cause," which is the word these authors have used.

BY MR. HUTTON:

Q. Well, perhaps we should let these authors -- who were apparently trained and schooled and have expertise in epidemiology to be able to tell us whether probable cause means probable causality, and let them answer that. Not you.

A. Well --

MR. ALLINDER: Excuse me. Object to the form. There's no question pending.

MR. HUTTON: Doctor, let me hand you Exhibit Number 11.

(EXHIBIT NUMBER 11 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. This is entitled "Epidemiology of lung cancer: A worldwide epidemic." Would you read into the record the conclusion I have highlighted?

MR. ALLINDER: Object to the form.

THE WITNESS: You have highlighted "Epidemiological evidence documents that most lung cancer cases could be prevented. With three million persons worldwide dying annually from lung cancer attributable to smoking, cigarette smoking remains the number one target for public health action to reduce cancer risk in the general population."

BY MR. HUTTON:

Q. Do you have any reason to disagree with the conclusion that three million people in the world are dying each year from lung cancer attributed to smoking?

MR. ALLINDER: Object to the form.

THE WITNESS: It's not my area of

expertise. I don't know how many people are dying worldwide.

BY MR. HUTTON:

Q. Three million people is a lot of people, is it not?

MR. ALLINDER: Object to the form.

THE WITNESS: Worldwide, that's -- it's a big number, but worldwide, I would have expected the number to be bigger than that.

BY MR. HUTTON:

Q. So, perhaps the number truly is bigger?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't know the answer to that, and I don't know how these authors came up with the answer to that, because the -- the -- the evidence of who's died and from what they died worldwide is -- is not very well documented.

MR. HUTTON: Let me hand you Exhibit Number 12.

(EXHIBIT NUMBER 12 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Entitled, "Female lung cancer."

It's another abstract published in 1996, and would you read into the record what I have highlighted with regard to this abstract?

MR. ALLINDER: Object to the form.

THE WITNESS: "Female lung cancer death rates increased by more than 550 percent between 1950 and 1991. In 1986 lung cancer surpassed breast cancer to become the leading cause of cancer death in women in the United States. The lung cancer epidemic is primarily attributable to cigarette smoking which is responsible for at least 80 percent of the disease in women."

And you have skipped a sentence or two. "Exposure to environmental tobacco smoke increases risk of lung cancer in nonsmoking women." And the final sentence is highlighted, "Since cigarette smoking accounts for the vast majority of lung cancer cases in women, efforts to prevent adolescent girls from starting to smoke and to encourage cessation among established smokers have the greatest potential for reducing the female lung cancer burden."

BY MR. HUTTON:

Q. Do you agree that it is very

important to encourage and promote adolescent girls from start -- from starting to smoke and to encourage cessation?

MR. ALLINDER: Object to the form.

THE WITNESS: That's kind of sexist. I agree we should prevent adolescent boys and girls from smoking, and try to get everybody to stop.

MR. HUTTON: The last abstract in the area of lung cancer I'll hand you is Exhibit Number 13.

(EXHIBIT NUMBER 13 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: And before you say anything, let me have the Court Reporter mark the balance of these.

THE WITNESS: Can we go off the record for a few moments?

MR. HUTTON: Sure.

VIDEOGRAPHER: Off the record at 11:56.

(RECESS TAKEN)

VIDEOGRAPHER: Back on the record at 12:02.

//

BY MR. HUTTON:

Q. Exhibit Number 13 is in front of you, sir; is that correct?

A. That's correct.

Q. And that's entitled, "Environmental tobacco smoke and lung cancer mortality in the American Cancer Society's Cancer Prevention Study. II." It's an abstract of an article published in January, 1997; is that correct?

A. That's correct.

Q. Okay. Read into the record what I have highlighted.

MR. ALLINDER: Object to the form.

THE WITNESS: "Lung cancer death rates adjusted for other factors were 20 percent higher among women whose husbands ever smoked during the current marriage than among those married to never-smokers."

And then, the final sentence -- two sentences, I guess, final next to last sentence, "Although generally not statistically significant, these results agree with the EPA summary estimate that spousal smoking increases lung cancer risks by about 20 percent in never-smoking women."

BY MR. HUTTON:

Q. Are you knowledgeable about this epidemiology study that was done?

MR. ALLINDER: Object to the form.

THE WITNESS: I'm not an epidemiologist, but two things that stick out in that sentence is that it wasn't statistically significant and it agreed with a summary estimate. Those, for a scientist, are not very convincing.

BY MR. HUTTON:

Q. But this abstract deals with ETS, the environmental tobacco smoke, as opposed to smoke actually inhaled in the individual; is that correct?

A. Yes.

MR. ALLINDER: Object to the form.

THE WITNESS: That's what it says.

BY MR. HUTTON:

Q. We'll shift into another part of the body -- area of the body.

(EXHIBIT NUMBER 14 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Exhibit 14 is entitled, "Cigarette

smoking: A risk factor for idiopathic pulmonary fibrosis," published in 1997. Would you read into the record what this abstract reflects, what I have highlighted?

MR. ALLINDER: Object to the form.

THE WITNESS: The only highlightings is, "A history of smoking is associated with an increased risk for the development of IPF."

BY MR. HUTTON:

Q. Did you know that there was thought to be a -- an increased risk between smoking and idiopathic pulmonary fibrosis?

A. It's not my area of expertise.

Q. Pulmonary fibrosis can be a very serious disease, can it not?

MR. ALLINDER: Object to the form.

THE WITNESS: I really know very little about pulmonary fibrosis, but definitely doesn't sound like it would be something you would want to have.

BY MR. HUTTON:

Q. Next exhibit is Exhibit 15.

(EXHIBIT NUMBER 15 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

//

BY MR. HUTTON:

Q. It's an abstract entitled, "A population-based case-control study of the relationship between cigarette smoking and nasopharyngeal cancer (United States)." Would you read into the record this section that I have highlighted that's published in this 1995 article?

MR. ALLINDER: Object to the form.

THE WITNESS: The only thing highlighted is the last sentence which says "The results of this study suggest that cigarette smoking may be related to the occurrence of nasopharyngeal cancer (especially squamous cell carcinoma) among US men."

BY MR. HUTTON:

Q. Where is the nasopharyngeal part of the body?

A. It's your nose and throat.

Q. So, nose and throat cancer, nose and throat squamous cell carcinoma, there seems to be in part secondary to smoking according to this epidemiologic study; is that correct?

A. I have only read the thing you had highlighted, but it says it suggests it. So, I

assume if we looked at it more closely, they don't have very good data. They just say it suggests it. That's a signal that they don't have -- it suggests it.

Q. It means it may be a fair inference or a fair conclusion to be drawn from the data; is that correct?

A. It means their data suggests that there may have been an association, but it doesn't -- they don't have a statistical association.

Q. Is there data that suggests that cigarette smoking causes lung cancer?

A. Is there data that suggest that? Yes.

Q. Exhibit Number 16 is dealing with pancreatic cancer.

(EXHIBIT NUMBER 16 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. That's cancer of the pancreas; is that correct?

A. That's correct.

Q. And the pancreas is a vital organ, is it not?

A. Yes.

Q. Here it discusses pancreatic cancer.

The abstract was published in 1996, was it not?
A. That's what it says.
Q. It says 100 percent of cases are fatal -- 100 percent of the cases of pancreatic cancer, according to this study, have been fatal; is that correct?
MR. ALLINDER: Object to the form.
THE WITNESS: That's correct. That's what it says.
BY MR. HUTTON:
Q. Read what I have highlighted, sir.
MR. ALLINDER: Object to the form.
THE WITNESS: I can't tell for sure. The highlight runs right between two sentences.
BY MR. HUTTON:
Q. Okay. Let me read it into the record, quote, "The most significant risk appeared to be cigarette smoking with a risk ratio about two." Does that mean that cigarette smoking will increase one's odds of developing pancreatic cancer twofold?
MR. ALLINDER: Object to the form.
THE WITNESS: I'm not an epidemiologist, and I don't know whether risk ratio -- I know they argue about how high a risk

ratio has to be before it means anything, and I don't really know whether two is a good number or not, and I don't think it does mean it doubles it. I think it means something else, but I'm not an epid -- I don't know how they use their statistics.

BY MR. HUTTON:

Q. You would defer to others to better address the epidemiologic significance of that?

A. Of pancreatic cancer? Definitely, I know very little about it, and I'm not an epidemiologist.

Q. There was something that was just recently published in Science that dealt with the issue of enzymes triggering emphysema in smokers, are you familiar with that?

A. I don't -- emphysema is not an area of my expertise, and I don't really look at those articles.

Q. Let me mark it.

MR. HUTTON: Let me mark this and then we'll -- let me mark this exhibit, and I apologize. I -- this is off the Internet. This is hot off the press. I got the journal. I just didn't have enough time to buy multiple

copies of Science. It's published in the September 26th edition of Science.

BY MR. HUTTON:

Q. Are you familiar with the magazine Science?

A. Yes.

Q. Do you subscribe to Science?

A. I don't currently. I go read it in the library. I've dropped all my subscriptions. I was spending a fortune on subscriptions. I'm one flight up from the library, so I go to read it. Plus I also read the Internet now, too, which someday there won't be libraries.

Q. I'm laughing because it's so true. But I used to belong to the Association where Science is the journal, and for many years, but I decided to drop that subscription.

(EXHIBIT NUMBER 17 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. Okay. Let me give you Exhibit Number 17, which is a collection of articles off the Internet that discuss specifically the article that I'm wanting to ask you if you read it. It's a September 26th edition of Science,

and it's actually entitled quote, "Requirement for macrophage elastase" --

A. Elastase?

Q. -- "elastase for cigarette smoke-induced emphysema in mice," beginning at page 2002. Have you read that article?

A. No. I don't read the literature on emphysema.

Q. Okay. Have you heard about this recent study that came out?

A. No, I have not. Well, I shouldn't be so sure -- I mean, I read a lot of things, but I don't -- I don't look into emphysema. I have enough to do with the cancer articles.

Q. I understand. Let me just give those to you. It may pique your interest in the quiet moments of your day. If you are interested, you might want to get a copy of this article, and what I have given you, this exhibit is summaries taken off the Internet; is that correct?

MR. ALLINDER: Excuse me. Object to the form of the question and everything that preceded it.

THE WITNESS: It has got "Yahoo" at

the top, which is a search engine on the Internet, but I have no way of knowing what this is, but that's what it appears to be.

BY MR. HUTTON:

Q. Okay. The article I'm wanting you to read is the one that's referenced here, "Enzyme Triggers Emphysema in Smokers." It's not the one that has anything to do with "Gonorrhea Infections Increase in Gay Men."

A. Yeah. That's not an area of my expertise, either.

Q. Nor mine. So, we'll -- I want to limit you here -- your subsequent work, if any, in this area, regarding this "Enzyme Triggers Emphysema in Smokers"; fair enough?

MR. ALLINDER: Object to the form of the question. Did you intend to have a question that you wanted him to respond to?

MR. HUTTON: No.

MR. ALLINDER: Or was that more of a statement?

MR. HUTTON: Methodically.

MR. ALLINDER: Okay. But he has not responded to it, if you wanted him to.

MR. HUTTON: Colloquy.

BY MR. HUTTON:

Q. I want to talk to you about monochromial antibodies, but I think we'll wait, have a quick lunch, and then see if we can get done here.

THE WITNESS: Okay.

MR. ALLINDER: Ready to go off the record?

VIDEOGRAPHER: Off record at 12:14.

(RECESS TAKEN)

VIDEOGRAPHER: We're back on record at 12:51.

BY MR. HUTTON:

Q. Doctor, I have marked various exhibits that are abstracts, and I want you to feel free to pull the article yourself at your leisure or have the Shook, Hardy & Bacon firm pull the articles for you, and feel like you should have the full opportunity of reading the entire article so that at the time of trial, you'll have had ample opportunity of reading at your leisure the entire article; fair enough?

MR. ALLINDER: Object to the form of that question.

THE WITNESS: That's fine.

MR. ALLINDER: I would note on the record that very few, if any, of these articles pertain to the area that an expert testimony is set forth in his report.

BY MR. HUTTON:

Q. Doctor, let me hand you another exhibit here.

MR. HUTTON: This exhibit is Exhibit Number 18.

(EXHIBIT NUMBER 18 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: I'm going to ask the Court Reporter to paper clip this. Oh, here it is.

BY MR. HUTTON:

Q. This is Exhibit Number 18 which is a section of a textbook, a textbook that is used in the medical education of medical students. It's found in libraries throughout the country that -- and in specifically, chapter one there is a section in there about cigarette smoking.

MR. ALLINDER: Excuse me, Mark. My copy of this has numerous pages attached to the back of it.

MR. HUTTON: That's a mistake, a

reproduction mistake. Yeah.

MR. ALLINDER: Thank you.

BY MR. HUTTON:

Q. Have you -- are you familiar with the textbook that's exhibit Number 18?

A. No, I'm not.

Q. If you'll turn to the third page, there's a section on there on cigarette smoking; do you see that?

A. I do.

Q. That has been highlighted? We don't have time to go through all that, but why don't you, at your leisure, read all that, and if allowed, at the time of trial, we'll probably examine you about some of the thoughts, concepts, principles that's set forth in that section that's highlighted; fair enough?

MR. ALLINDER: Object to the form.

THE WITNESS: Sounds fine.

MR. ALLINDER: Mark, if I may note for the record, please, we've been skipping around in the pages on this exhibit. Maybe we'd better identify. We obviously have the cover, and we have got inside the front cover, and then we have pages four, five, six, page eight, page

51, page 196, page 216, page 375, page 820, page 822, page 923 and page 933. Do you think I got each of the pages? Does that sound right to you?

MR. HUTTON: What's the last page?

MR. ALLINDER: 933.

MR. HUTTON: 933, yes.

MR. ALLINDER: Is that not right?

MR. HUTTON: Page 933, there's a section here on nicotine that I would request that you read.

THE WITNESS: You'd like me to read?

MR. HUTTON: No. Read it between now and the time of trial. Exhibit Number 18. I'm -- let me hand you.

THE WITNESS: Did I get --

MR. HUTTON: I'm sorry. Let me give you the exhibit.

MR. ALLINDER: May I look at that for just a moment, please?

THE WITNESS: This has more highlighted than that one does.

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: Read what's highlighted, but feel like you can read anything

that I have not highlighted. There is some meaningful, significant and important information that will educate all of us on issues involving cigarette smoking.

MR. ALLINDER: I object to all of that. Mark, do you want to leave on this exhibit these red flags that were on the margin? Do you wish to -- because they are not going to come out on the copy of the exhibit as they go into the record.

MR. HUTTON: You can take them off, or you can if you want to.

MR. ALLINDER: Do you want to remove the red flags and leave the highlighting? This is another highlighted exhibit.

MR. HUTTON: Right. We can take off the red flags. I don't know why we use red -- hot red flags, whether that means anything, but we'll remove the -- the intensity or the color of the flags.

MR. ALLINDER: Well, if we're going to have flags on there, there needs to be some way of reporting it on the record. Obviously, these won't come through very clearly.

//

BY MR. HUTTON:

Q. The next exhibit is textbook of Cancer. It's a thick textbook on cancer principles, of practice of Oncology, it is the textbook -- it's the textbooks used by residents that are in the area of Oncology. Every -- almost every Oncologist in the world will have this textbook. I'm trying to tell you how important this textbook is, and I think any Oncologist will tell you that this is the so-called Bible of cancer of Oncology.

MR. HUTTON: And again, let me mark this as Exhibit 19 and ask you to -- to peruse this and read it at your leisure, and be prepared to discuss it at the time of trial; fair enough? Exhibit 19.

(EXHIBIT NUMBER 19 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. ALLINDER: Same objection to any requests to review materials prior to his testimony at trial. Do you want to take a look at these flags to decide whether you want to leave those on or take them off?

MR. HUTTON: Take them off.

MR. ALLINDER: And this, I assume,

is highlighted, as well?

MR. HUTTON: Yes.

MR. ALLINDER: Apparently it is. Exhibit 20 will be a textbook in the area of internal medicine. It's called Harrison's Principles of Internal Medicine. It is again the textbook that physicians or aspiring young medical students use in medical school in the area of internal medicine. It's the Bible of internal medicine that internists have amid their library --

(EXHIBIT NUMBER 20 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

BY MR. HUTTON:

Q. And again, take your time to read that at your leisure, and be prepared to discuss the issues within that at the time of trial. Exhibit Number 20.

MR. HUTTON: And again, for the record, counsel is instructed or requested to take off all the red stickies.

MR. ALLINDER: And Mark, I'm continuing my objection to both your statements with respect to each of these exhibits, and your request that the witness review these materials

or study them prior to testifying at trial.

MR. HUTTON: Exhibit 21 is another textbook in the area of family practice, a textbook that family physicians use in the counseling and the medical treatment of their patients. This is Exhibit Number 21.

(EXHIBIT NUMBER 21 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. ALLINDER: Each of these have highlighting in them? 20 does, I see.

MR. HUTTON: The originals.

MR. ALLINDER: 21 does, also.

MR. HUTTON: If the exhibits --

MR. ALLINDER: The original exhibit has highlighting.

MR. HUTTON: Yeah. The exhibits should be partially highlighted, but I'm requesting the witness to be able to read anything he wants within that exhibit or the entire textbook, for that matter, but we tried to limit it to the issues involving smoking and cancer. The next textbook --

THE WITNESS: Will I be an MD when I finish this?

MR. HUTTON: You will be extremely

well-educated in the area of smoking, cancer and related issues. Mr. Hutton will be willing to certify you as such, I'm sure.

(EXHIBIT NUMBER 22 WAS MARKED FOR IDENTIFICATION)

(DOCUMENT HANDED TO WITNESS FOR REVIEW)

MR. HUTTON: The next one is Exhibit Number 22, and this is Lange's Medical Book. It's the series of current medical diagnosis and treatment, again, that discusses various issues of -- of smoking cancer and smoking-related issues

MR. ALLINDER: One more note on the record regarding these exhibits. Each of these that we have looked at, 19, 20, and 21, I read into the record the pages from Exhibit 18. Nineteen, 20 and 21 are also selected pages. I don't intend to go through the process of reading into the record each and every page, but they are partial copies of the textbooks, and the same is the case with Exhibit 22, both in terms of selected pages as well as in terms of highlighting. Presence of highlighting.

MR. HUTTON: Doctor, thank you for your time.

THE WITNESS: Thank you.

MR. EDWARDS: Let's go off the record for a few minutes.

VIDEOGRAPHER: Off the record at 1:02.

(RECESS TAKEN)

VIDEOGRAPHER: We are back on the record at 1:07.

EXAMINATION

BY MR. EDWARDS:

Q. Dr. Hamm, my name is Craig Edwards. We met earlier. I'm with the Barnes case in Pennsylvania and with the law firm of Mellon, Webster & Mellon, and as has applied before, if you need a break or you need to speak with your attorney for a moment, just let me know. I'll be happy to oblige.

A. Thank you.

MR. ALLINDER: May I ask you a question, Craig, before we get started? You mentioned a couple of times that you were from the Barnes case. Do you mean to indicate that Mr. Hutton is not from the Barnes case?

MR. EDWARDS: No. Mr. Hutton is -- is here. I don't -- I don't know exactly in what capacity -- he's from Wichita -- but I

believe he has Cross-noticed or Noticed this dep. I just always identify which case I'm with when I speak.

MR. ALLINDER: This deposition has not been Noticed in any case other than the Barnes case.

MR. EDWARDS: Okay. Then he is with the Barnes case.

MR. ALLINDER: So, I understood all along he was acting as Plaintiffs' counsel for the Barnes case for this deposition, and if he is not, I would appreciate knowing that, and would have objected to the deposition in the beginning, because it hasn't been Noticed in any other case.

MR. EDWARDS: Yeah. If that's the case -- I did not look at his paperwork, but there are times when depositions are Cross-noticed with other states, state of New York and so forth. This is most likely not one of those instances, and Mr. Hutton was more than likely acting on behalf of Barnes or in the Barnes case earlier today.

MR. ALLINDER: Okay. Well, I want to note on the record that the only Notice of

Deposition that I have received is the Notice of Deposition in the Barnes case that was issued from the Sheller, Ludwig and Badey firm dated September 15, 1997. And to my knowledge, this deposition has not been Noticed in any other case, and Mr. Hutton was acting on behalf of the Plaintiffs in Barnes.

MR. EDWARDS: Noted.

BY MR. EDWARDS:

Q. Dr. Hamm, are you familiar with an organization called the "Counsel for Tobacco Research"?

A. Yes, I am.

Q. Do you also know that it's otherwise known as CTR?

A. Yes.

Q. Are you familiar with an organization called the "Tobacco Institute"?

A. Yes.

Q. Are you aware that it's also known as TI?

A. Yes.

Q. Okay. Have you ever heard of the Frank statement?

A. Yes, I have.

Q. Do you know by whom the Frank statement was put out?

MR. ALLINDER: Object to the form.

THE WITNESS: It was signed by the Chief Executive Officers of most of the tobacco companies.

BY MR. EDWARDS:

Q. Okay. Are you familiar with the organization "Tobacco Institute Research Council"?

A. Yes.

MR. ALLINDER: Object to the form. It's "Industry," "Tobacco Industry Research Council."

MR. EDWARDS: Excuse me.

BY MR. EDWARDS:

Q. "Tobacco Industry Research Council."

A. I didn't even catch the difference.

Q. Otherwise known as TIRC?

A. Yes.

Q. Your knowledge of these organizations is based on what?

A. I have read the annual reports, all of them. I have read the minutes of the -- of the Scientific Advisory Panel, I believe all the

minutes up to -- I haven't read like current, you know, the last few years' minutes, but I read up to a few years ago. I have looked at the documents that were CTR documents that related to the contracts at Microbiological Associates.

Q. Is -- I'm sorry.

A. There was probably other things that I looked at, as well.

Q. Is Microbiological Associates or MAI the primary study in what you consider yourself educated with regard to CTR?

MR. ALLINDER: Object to the form of the question.

THE WITNESS: I have looked into all animal research relating to tobacco, and regardless of who funded it, but it's -- I focused on the Microbiological Associates' work. I have also looked into the Homberger work and the Leuchtenberger work, and I could probably think of some more, but I focused on the animal-based research regardless of who funded it, and then focused in under CTR funding on -- on the ones I have just mentioned.

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BY MR. EDWARDS:

Q. Okay. Do you have an understanding of what the charter for CTR is or was?

A. I'm not certain I know what you mean by "the charter."

Q. Do you know what its stated purpose was?

A. I'm familiar with the Frank statement which started the -- the whole thing, but I -- as far as a charter or a -- a statement, I have seen some of their press releases, I have read all of the annual reports, most of which include statements of purpose.

Q. Okay. To the best -- I'm sorry?

A. But I don't know a charter, per se. If there's something else, I'm not certain what you're talking about.

Q. Yeah. Excuse me. I use it in a broad sense. Not a specific document.

A. Okay.

Q. That wasn't a question. To the best of your understanding, what is the purpose of CTR presently?

A. It's my understanding that the CTR is a organization funded by the tobacco companies to

review and fund research. I could go into more detail than that.

Q. Okay.

A. But that's their basic --

Q. Does that purpose, to the best of your knowledge, differ from, as you understand it, CTR's originally stated purpose?

MR. ALLINDER: Object to the form.

THE WITNESS: It -- it -- that seems to me to have been one of their major activities. They have done other things, as well, but that has been one of their major activities since the beginning.

BY MR. EDWARDS:

Q. Okay. Maybe I didn't phrase the question right. What I intended to ask was whether, as -- as you have seen CTR evolve over the years in your reading, not that you're an expert on CTR, perhaps, but as you have seen CTR evolved, has their purpose changed at all since its founding to the present time?

MR. ALLINDER: Object to the form.

THE WITNESS: I must not understand your question, because I'm tempted to give you the same answer that --

BY MR. EDWARDS:

Q. That's fine. If that's your answer, I accept it.

MR. ALLINDER: Object to the form.

BY MR. EDWARDS:

Q. Are you familiar with the Scientific -- excuse me. Strike that. Do you know what the Scientific Advisory Board is?

A. Yes.

Q. Otherwise known as the SAB?

A. Yes.

Q. What is the role of the SAB?

A. The Scientific Advisory Board is a group of eminent scientists who were brought together to review grants and contracts that were presented to the CTR.

Q. Are those scientists independent of the tobacco companies?

MR. ALLINDER: Object to the form.

THE WITNESS: "Independent" is a relative word. They serve on the Scientific Advisory Board. So, in that capacity, they get some money from the tobacco companies, but their role as advisors is to act independently of those companies.

BY MR. EDWARDS:

Q. In all that you have read, has that been the case?

MR. ALLINDER: Object to the form.

THE WITNESS: It's something that I attempted to look at, and the things that I reviewed, and I didn't find anything that would lead me to believe otherwise. It's difficult, because many of the things that are presented and so forth are difficult to interpret. They are subject to a number of interpretations, but I didn't see anything that looked to me to be unusual.

BY MR. EDWARDS:

Q. Do you have any knowledge about the Board of Directors of CTR?

A. I have some knowledge of them, yes. I have read the minutes. I have seen memos, I have --

Q. Included within that knowledge, or I should say using that knowledge, do you have an understanding of how the Board of Directors of CTR interfaces with the tobacco industry?

MR. ALLINDER: Excuse me. Object to the form.

THE WITNESS: It's -- all I -- the

only knowledge I have are those things that I have reviewed, which would make it difficult to know what all of their relationships were. So, I -- I know how they -- I saw the minutes of their meetings, I saw who was at the meetings, those kinds of things, but I have no real way to know what all of their interactions may have been.

Could I -- I'd like to expand that a little bit. I worked in a similar organization. I was the head of Toxicology at Chemical Industry Institute of Toxicology, which is a nonprofit research institute set up by the chemical industry. So, I have some knowledge of how our interactions were with our member companies, but I don't know for sure that all the interactions were exactly the same, but I probably have a fairly good appreciation for how these organizations work, because I have worked in capacity similar to the aspects that I have been looking into.

BY MR. EDWARDS:

Q. As it relates to CTR, what is the difference between a grant and a contract?

A. Well, and I don't think it's really

specific just to CTR. It's grants and contracts in -- by most organizations, typically -- I'm going to give you a sort of a general answer, but realizing that in each case, in each organization, each grant or contract may vary somewhat by whatever language is put into the actual document.

But in general, a grant is where you're given more latitude to determine what you're going to do, how you're going to do it, and a contract is a more specific document where you're essentially saying, "Here's exactly what we want you to do, and we're going to monitor you doing it."

But each document, some grants can be very restrictive and some contracts can be very nonrestrictive just based on the particular instrument that's used for that particular study, but in general, that's the difference.

Q. Of the two, that is grant or contract, what was the MAI study?

MR. ALLINDER: Object to the form.

THE WITNESS: They had some of each. When you say, "the MAI study," they had lots of studies.

BY MR. EDWARDS:

Q. Speaking of -- I'm sorry, go ahead.

A. The long-term mouse inhalation study was a contract.

Q. Okay. Is there -- strike that. As CTR handled that particular contract, was it a contract where CTR exercised significant control or not a significant amount of control?

MR. ALLINDER: Object to the form.

THE WITNESS: Ten reasonable people could answer that ten different ways, because it's a matter of viewpoint. So, I'm sure some people thought it was under-managed and some people thought it was over-managed, but compared to contracts -- I have been in the position -- when I was at the Cancer Institute, we let a lot of contracts, and we had significantly more control, I would say, on those contracts than what I saw. It appeared to me that MAI was given quite a bit of leeway to do a number of things under their contract.

BY MR. EDWARDS:

Q. Do you personally know Dr. Henry, Carol Henry?

A. I have met Dr. Henry, and she's -- I think

was entertained at a party at my house at one time.

Q. Do you have any opinion as to her ability in her field?

A. I think she is considered a respected scientist.

Q. Do you have any knowledge of a Dr. Kouri?

A. Yes.

Q. Richard Kouri?

A. He -- I had contracts with him when I was at the Cancer Institute. He -- he also did contracts for the Cancer Institute at the same time he did the MAI contract.

Q. Do you have any opinion as to his ability in his field?

A. I think he's a well-respected scientist.

Q. Are you familiar with -- strike that. Do you know of a Doctor Kriesher (phonetic) who was formally affiliated with CTR?

A. I have never met Doctor Kriesher (phonetic) and I don't know him in any other context except in the context of reading the information that I have read for this, and so, I'm aware of his role in the contracts and so forth, but I don't

know him personally. I have never met him.

Q. What was his role with regard to the inhalation study we spoke about?

A. He -- I'm sorry.

Q. Go ahead.

A. He was the -- I don't think they have -- I never saw in their writing any place the official designation contract monitor, but most places use the term, and he -- he worked in that capacity and worked closely with -- with Kouri particularly, it appeared, to develop and -- and relate back what was going on at the MAI -- the long-term inhalation study.

Q. Who would have a better understanding of what results had been learned from the MAI study; yourself or Doctor Henry?

MR. ALLINDER: Object to the form.

THE WITNESS: The results speak for themselves. So, that's the advantage of having those results, and that's the advantage of having them published so that we can all take those results and determine that. I think, in fact, I have a great deal more expertise in carcinogenesis, assays of this type than they do. They have more expertise in the particular

study of -- I, for example, have never administered smoke to an animal, but I have -- I have evaluated hundreds of these kinds of experiments, and I know a great deal more about the animal models, but that would be debatable, too.

BY MR. EDWARDS:

Q. So, as you said, it's subject to interpretation study, and that's what's nice, because -- I don't mean to misstate you. I'm summarizing for myself, as I understand what you said, that the studies produced and everybody can come up with their own interpretation. If the individual who actually did the study comes to a conclusion on what the study means, are you saying that that's of no more relevance than what a peer review might be?

MR. ALLINDER: Object to the form.

THE WITNESS: It doesn't matter -- let's say I'm writing a paper and I come up with a conclusion. The data speak for themselves, and if I'm wrong, I'm wrong. The fact that I did the study doesn't make me any better at interpreting it, and these are kind of standard studies, and there are standard ways of

interpreting them.
BY MR. EDWARDS:
Q. Should a study like the -- speaking of the same MAI study, the long-term inhalation study, should a study of that nature be given to the scientific community and/or the public at large in raw form for interpretation?
MR. ALLINDER: Object to the form.
THE WITNESS: It's -- it wasn't, and the fact that they're saying that they gave no interpretation, I can't understand, because the -- the technical report publication has pages and pages and pages of interpretation. So, the study was interpreted by the authors when they submitted it. What wasn't in there was speculation about what relevance this had, perhaps, to humans, for example.
So, it's completely appropriate in a technical report that it be presented in the way it was presented, and then, when they published their paper in JNCI, they were allowed to do the other speculation, and that's almost a standard way to do technical reports versus publications. It's a very common practice.
So, when we publish technical

reports at other organizations that I belong to, we did a very similar thing. The technical report had the data interpreted, but based only on -- you could only go as far as the data would allow you. Then when you wrote the paper to a journal, you put the speculation in.

So, I -- I looked carefully at that issue, because I knew there were people objecting, the authors were objecting, and it appeared to me to be almost standard practice. So, I don't understand, myself, the basis for their objections.

BY MR. EDWARDS:

Q. What seemed to be standard practice?

A. To publish the technical report and analyze and interpret the data, but not speculate on -- on what it may mean for humans and so forth.

Q. Are you speaking of the now infamous blue book?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't consider it infamous. I am speaking about the blue book.

BY MR. EDWARDS:

Q. Okay.

A. I'm calling that the technical report,

because that's basically, in my view, what it is. It's the technical report of that study.

Q. Okay. And do you have a problem with -- strike that. Are you familiar with the foreward --

A. Yes.

Q. -- to that technical report?

A. Yes, I am.

Q. And does that foreward accurately reflect the contents of the report?

A. In -- in my opinion, there's nothing in the foreward that is not substantiated by the data that's there, and it's only a few sentences and was intended, it appears to me, to simply be that, a foreward, and the statements in that foreward are accurate.

Q. Do you -- do you commonly see a study such as that MIA study being issued with a foreward from an individual not related to the study?

MR. ALLINDER: Object to the form.

THE WITNESS: When we, at the National Cancer Institute, published our technical reports, we didn't even allow the people who did the study to write them. We

wrote them -- people wrote them that had nothing to do with the study. So, the data speak for themselves. So, it's a common practice to publish technical reports in that manner. In this case, the authors wrote every single word in the technical report except for that few sentences in the foreward. That's an unusual practice of a lot of latitude to the contractor.

MR. ALLINDER: Craig, can you wait for just a second?

MR. EDWARDS: Sure.

BY MR. EDWARDS:

Q. If, as is the case with the MAI study and the foreward we have been speaking of, if a foreward is inserted in front of the study or report such as this, is it also common practice that the researchers do not get to review or at least read the foreward prior to the report being publicized?

MR. ALLINDER: Object to the form.

THE WITNESS: I can't speak for the world, but the two places I work, CIIT and NCI, that was standard practice. We wrote the technical reports, published them. The -- the people who did the studies provided the data,

and they didn't read anything but prior to the thing being published.

BY MR. EDWARDS:

Q. And the person writing the foreward would not have to have any specific knowledge in that field or that study?

MR. ALLINDER: Object to the form.

THE WITNESS: The person who wrote the foreward was a very well known pathologist who was very able to interpret the study, and the sentences he made, whether -- if you want to question his credentials or anything else, you can do that, but the statements that he made are absolutely supported by what's in the technical report, and I looked at that carefully to see if I could determine anything otherwise, and his statements are absolutely accurate.

BY MR. EDWARDS:

Q. Why, then -- and I realize this is somewhat speculative. Why, then, would the authors object?

A. I really --

MR. ALLINDER: Excuse me. Object to the form. Are you asking him to speculate?

MR. EDWARDS: No, I'm not asking him

to speculate, but Dr. Hamm read the report, he read the foreward, he is saying that there -- there's no disparity between the two, and I'm saying if he read them both, what would be an objection that the actual authors of the report had to that particular foreward.

MR. ALLINDER: Object to the form. If you can answer it, go ahead.

BY MR. EDWARDS:

Q. If you can.

A. It's impossible. I have read their objections, I have gone back -- back and forth. I have looked through all the documentation, and I can't, based on what's in the written record, determine what -- what the -- why they're unhappy with that at all. I can't. So, I don't know. I really -- there's no way to know why they're saying the things they are saying.

Q. Could it be -- strike that. Well, could the objection be that the individuals who performed the actual study have the highest degree of knowledge as to what they did in the study, and that somebody who is attempting to interpret the data and the information simply does not fully comprehend what took place?

MR. ALLINDER: Object to the form.

THE WITNESS: I don't think so. The data speak for themselves, and the statements that are made in that foreward are absolutely accurate. They make the statement that by having this foreward, people won't understand the paper or people won't know what it really means and so forth, which again doesn't make sense, because the data speak for themselves.

BY MR. EDWARDS:

Q. Why is the foreward necessary, then?

MR. ALLINDER: Object to the form.

THE WITNESS: In my mind, it wasn't necessary nor did it affect -- to me, it really doesn't matter whether the foreward is there or not. The data speak for themselves and the data are fully presented. I think it was put in there because they -- they wanted -- you know, usually when you present something like that, you put a foreward in that says "Here's" -- "Here's what we think," and there's nothing inappropriate with that.

And by having the foreward in there, people who are knowledgeable about the issue will look at the statements to see if they are,

in fact, correct, and if the data don't support it, then they'll -- it's easy to figure that out. And so, I don't know why -- since the data do support what he says, I don't know why they object.

BY MR. EDWARDS:

Q. Considering the magnitude and length of a study such as this MAI smoking inhalation study, would the average -- to the best of your knowledge, would the average non-scientific person take the time to read that entire report?

MR. ALLINDER: Object to the form.

THE WITNESS: The average nonscientific person doesn't read any of these articles that we're talking about, so -- but the average non-scientific person who wished to look at it, the data is there, but even among scientists, you need help understanding some of the -- of the paper, but the foreward would be easy for even a non-scientist to say is this supported by the data, because the -- the statements in the foreward to me are -- are simply a restatement of what happened.

So, I think the average non-scientist wouldn't read that report. Have

you read -- anyone who's read the blue book, it's a very complex -- all technical reports have a great deal of information in them, and I have read the book many times, and I'm still finding things in there that I didn't see the first time through, so --

BY MR. EDWARDS:

Q. Me too.

A. It's not an easy book to interpret even for a scientist.

Q. So, then, most -- most non-scientific individuals would most likely derive their conclusions from the foreward?

MR. ALLINDER: Objection. Misstatement of his testimony.

THE WITNESS: No, I don't think the average non-scientist would look at the book at all. I don't think the average non-scientist would look at it at all.

BY MR. EDWARDS:

Q. But if they did, what would they read --

MR. ALLINDER: Objection to the form.

THE WITNESS: I have no way of

knowing that.
BY MR. EDWARDS:
Q. They wouldn't read the report; correct?
MR. ALLINDER: Objection to the form.
THE WITNESS: I don't know. When I read things, I read them. So, I don't think I would pick any book up and just read the forewards and decide that was the -- the whole story. Kouri and Henry wrote a summary that's in there that I would assume you would read, too. So, I wouldn't think you would just stop if - if you're going to read a book, I wouldn't think you would stop at the one-paragraph foreward.
BY MR. EDWARDS:
Q. Unless the book was highly technical?
MR. ALLINDER: Object to the form.
THE WITNESS: I think, in fact, even if you did only read the foreward, the foreward is supported by the facts of the book.
BY MR. EDWARDS:
Q. But that's my question. Do you

think that the average non-scientific person, if they read something in that book, what would it be: the report or the foreward?

MR. ALLINDER: Objection to the form. Asked and answered. Calls for speculation.

THE WITNESS: I would think the average person, if he picked the book up, would read more than the foreward, but I don't know. We publish technical reports from the Cancer Institute in CIIT and a very similar format where you would have the same problem for the average non-scientific reader.

BY MR. EDWARDS:

Q. Okay. Are you aware of any studies that CTR funded, whether they be contracts or grant, that spoke to the relationship between lung cancer and cigarette smoke?

MR. ALLINDER: Object to the form.

THE WITNESS: I'm sorry. Could you ask that question again?

BY MR. EDWARDS:

Q. Are you aware of any studies that CTR funded, whether they be a grant or a contract, that attempted to find the link

between cigarette smoking and lung cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: My view -- reading the annual reports, there were hundreds of studies every year that attempted to do that. So, I -- I don't know.

BY MR. EDWARDS:

Q. So, are you saying that there was -- CTR funded hundreds of studies that specifically sought out whether cigarette smoke was related or caused lung cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: There were many, many studies that that was their exact intent. Now, what may be hard for a non-scientist to see is how some of these studies related, but they all related. So, the Scientific Advisory Board was picking of those projects submitted to them, those projects that were most scientifically meritorious to work on the association.

BY MR. EDWARDS:

Q. Does a study on genetics and cancer relate specifically to smoke inhalation and cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: It certainly can, because genetics may be a risk factor. So --

BY MR. EDWARDS:

Q. How about a study concerning pedigree?

MR. ALLINDER: Object to the form.

THE WITNESS: I saw in each annual report hundreds of studies all of which, in my mind -- now, they were broken into -- because they worked on other aspects of the tobacco story besides lung cancer, but -- and in some of the annual reports, they listed them that way. These are the ones that are lung cancer and so forth, but the studies were all related to trying to understand that relationship.

BY MR. EDWARDS:

Q. Would a study about -- in a person's environment, meaning the area in which they live and function on a daily basis, would a study concerning that question involve the link between cigarette smoking and lung cancer?

A. It --

MR. ALLINDER: Object to the form.

THE WITNESS: It can.

//

BY MR. EDWARDS:

Q. Can?

A. Because an individual is subjected to a number of risk factors. And so, you can't just study one and get at why you have this association.

Q. So, what study would -- strike that. Was there any CTR-funded study that didn't relate to smoking and its link to lung cancer?

MR. ALLINDER: Object to the form.

THE WITNESS: Well, they were working on other aspects of smoking and health. So, not all of the studies were related to lung cancer. They did fund studies in other areas of smoking and health, but all -- this was a meritorious group of scientists picking those projects that they felt had the most to bear on the question of smoking and health, and many of those were the lung cancer question, but they did fund other types of studies.

Q. Is there any hazardous material in a cigarette?

MR. ALLINDER: Object to the form.

THE WITNESS: There are a number of hazardous materials in a cigarette. There are

hundreds of different compounds, and then when you burn it, hundreds more are -- are created, and many of those are known to be hazardous when they're in high concentrations.

BY MR. EDWARDS:

Q. What happens when you burn a cigarette? Does the concentration increase or --

MR. ALLINDER: Object to the form.

THE WITNESS: It's not my area of expertise, but when you burn things, even new compounds are formed that weren't even there previously, and that's true of burning anything. And then specifically burning tobacco, quite a bit is known about this process, but it isn't my area of expertise, and I don't really look into that when I'm reading things. But quite a bit is known, and when you burn anything, you create new compounds that didn't exist previously.

BY MR. EDWARDS:

Q. Without meaning to misstate prior testimony, I believe you said earlier today that the term "nicotine" -- "nicotine addiction" is used precisely.

A. No.

MR. ALLINDER: Excuse me. Is that a question?

MR. EDWARDS: No.

MR. ALLINDER: Object to the form.

MR. EDWARDS: It's not a question yet.

BY MR. EDWARDS:

Q. How would you define nicotine addiction?

MR. ALLINDER: Object to the form.

MR. EDWARDS: What's objectionable about that?

MR. ALLINDER: This is not within his area of expertise.

MR. EDWARDS: Well, he's answered a lot of questions today --

MR. ALLINDER: He has said a dozen times today that he is not an expert in the area of addiction. It is not within the scope of his expert rapport. He has answered all these questions as a lay person. You're coming back and asking him the same questions he has gone through before. I mean, go right ahead, but it is objectionable, because he is not offering expert opinion in this area.

MR. EDWARDS: I'm not asking him to offer an expert opinion in this area. I'm asking him:

BY MR. EDWARDS:

Q. With your knowledge and your reading, which is far more extensive than mine in this area, can you explain to me -- and I'm specifically asking about nicotine addiction and how you would define it as a non-expert in the field of nicotine addiction. How's that?

MR. ALLINDER: I object to the form.

THE WITNESS: What I said -- what I said earlier, I didn't say that I could define nicotine addiction precisely. I said just the opposite, I hope, that -- that I don't know the precise definition of addiction, and I think within the field of addiction, people who work in that area probably have some pre -- precise definitions, and whether nicotine fits into that or not, I don't know.

I know there's a lot of controversy there, whether it's habituating or whether it's addicting, and I'm not sufficiently knowledgeable to tell you whether it's one or the other, but it doesn't seem to me, as a lay

person, to be -- if it is an addiction, then there's got to be a large scale of addiction compared to people I've known that were addicted to things like heroin and cocaine and so forth where the addiction took over their life.

And so, to me, it seems more like it's a habit-forming thing, and I don't know, in fact, that nicotine is -- is -- you know, there may be other things in there that -- the pleasure of it, or there may be other aspects of it that are what keep people smoking. It's another area I'm not an expert in.

Q. What do you mean when you say "habit-forming"?

MR. ALLINDER: Same objection.

THE WITNESS: Well, it's -- I -- I can't precisely define any of these terms, because it's not my area of expertise. So, I would assume within the field, there are precise definitions that would change it from being habit-forming to addicting, but "habit-forming" means, to me as a lay person, that you -- it's something that you get habituated to and you do, you have trouble quitting doing it.

But to me, it's not the same order

of magnitude as being addicted where you have -- you have a much more difficult time stopping doing something when you decide to stop. I have known a number of people who I know work in this field, and they argue all the time about these terms, and I just am not sufficiently knowledgeable to know where habit-forming ends and addiction starts and how broad the range of addiction is --

BY MR. EDWARDS:

Q. If there's not a good animal model -- strike that. I want to -- without going back to questions you have answered, I need to precede my next question with what might seem somewhat redundant. I believe you said earlier there's not a good model for studying cigarette smoking as it relates to lung cancer, an animal model, that is; am I misstating your former testimony?

A. No, that's correct, that of the -- of the types of animal models that have been created, there are serious objections to most of them, and -- and I did say earlier, and it's my belief that there's not been a good animal model developed, and that makes it very difficult to

study the issue, because you're limited in what you can do with humans.

So, you -- you are very limited in what experiment you can do, whereas animals, you have more latitude, and if you had a good animal model, you could make some more progress on trying to understand smoking and health, but no such model has really ever been developed by anybody.

Q. If I'm considering smoking, and I ask you with your knowledge of both the animal model and of cancer whether I should take up the practice, your advice to me is?

A. Well, again --

MR. ALLINDER: Object to the form.

THE WITNESS: It isn't really my area of expertise, and I don't have very many people ask me this question, but I'm a nonsmoker. I don't believe in smoking. I wouldn't encourage anybody to smoke, and I wouldn't get in -- probably into the whole story of the animal models and what that means and so forth. But it -- it -- when you look at all the data, you get into a -- more of a feeling that -- that because we haven't proven a lot of these

things, that the question is still open, and -- but again, I wouldn't say that to somebody -- I'd basically, if someone asked me, "Should I smoke?" I would say, "No, I don't encourage you to smoke."

BY MR. EDWARDS:

Q. If the question is still open, in your lay opinion, should we err on the side of caution?

MR. ALLINDER: Object to the form.

THE WITNESS: I have already said that I don't smoke and I don't think anybody else should smoke, and I think that we have erred on the side of caution since '64. Every pack has said this stuff causes cancer. So, I think we have already warned the public, and I think that's appropriate, and I'm not saying because it isn't proven that -- that -- that we can just ignore these issues. It is a strong risk factor that's in the epidemiology.

BY MR. EDWARDS:

Q. But you would not tout the existing studies on smoke inhalation and cancer as conclusive?

MR. ALLINDER: Object to the form.

THE WITNESS: The epidemiology studies -- show strong -- that it is a strong risk factor, and those have been repeatable. They do show a dose response and so forth, but we haven't been able to validate these studies using animal research, and generally with a carcinogen, that's what you attempt to do. As well as making an animal model to -- for further study, you're validating that this is, in fact, carcinogen, and for whatever reasons, that hasn't been able to have been accomplished.

BY MR. EDWARDS:

Q. What is fractionate research?

A. Early on, in many of the things I read, what people were proposing to do would be to take the -- the tars and so forth and split them into fractions, try different combinations of cigarettes -- you know, different types of cigarettes and so forth, test these fractions and see if they can find out which one has so-called biological activity, meaning does it cause cancer, and finding such a fraction to remove it. And -- and so, that's where a lot of the skin painting work was done early on, was trying different types of compounds to see which

compound supposedly had the -- the so-called biological activity.

Q. If I wanted to find out the link between smoking a tobacco product, specifically a cigarette, and lung cancer, would fractionate research be an important part?

MR. ALLINDER: Object to the form.

THE WITNESS: It --

MR. EDWARDS: You want to just have a running objection?

MR. ALLINDER: No.

THE WITNESS: It could be -- the data always speaks for itself, and each piece of data may help you understand some aspect of what you're looking at, but the trouble with that research is it may not be any single item. It may be a combination. They may even be things in different fractions, and the concentration is very important.

So, when you do those studies, generally if you use low concentrations, you don't get anything. And so, you raise the concentration. By raising the concentration, you may be getting erroneous data. So, you may take a fraction, raise the concentration of

that, test it and it's positive, but that may not be the fraction that's causing the problem. You have just created a positive by -- by concentrating that fraction. You have changed the whole mechanism.

BY MR. EDWARDS:

Q. How do you solve that problem?

A. Basically, and -- and it's -- I think the Scientific Advisory Board had the right idea, is you -- you fund a lot of basic research and try to get into -- let the most prominent scientist in the land come up with the best ideas to do basic research to look at all the basic mechanisms of even how a cell works, which may have no direct -- someone might not be able to tell why that has anything to do with cancer research, but it does, and as our basic research knowledge grows, keep trying to put links together of how the mechanism works.

But the mechanism of all these chronic diseases is so complex that you may not note that scientists are pretty good at coming up with cures for infectious diseases, because it's much simpler. Even AIDS, which was a very complex disease, is -- the mechanism is fairly

well-known now, because it's such simpler.

Cancer, even though tremendous resources have been spent on it by the federal government, by the -- by the tobacco companies, by everybody, we still do not have enough information, and it's so complicated that it may -- it may be very difficult to ever figure out what the mechanism is.

I was at a meeting recently where a very prominent cancer scientist who's working on a different issue, working on liver tumors in mice, started talking about we have to use chaos theory to start working on this, and when you start talking using chaos theory to understand a cellular mechanism, you realize that we're -- it's really going to be complicated to figure out.

Q. Considering all that and considering the existing studies -- and I know that's over-broad -- what specifically would be the reason you would tell me not to take up the practice of smoking?

MR. ALLINDER: Object -- object to the form. Asked and answered.

THE WITNESS: The main -- the main

reason I would tell you that is because the epidemiology --

BY MR. EDWARDS:

Q. Epidemiology?

A. -- shows there is a strong association that it's a strong risk factor, and I would recommend for all chronic diseases that if you can avoid risk factors in those diseases, it's to your benefit to do that.

Q. All right.

MR. EDWARDS: All right, Doctor. I have no further questions.

THE WITNESS: Good. I was just about to ask for a break.

MR. EDWARDS: Counsel -- if counsel wants to cross or --

MR. ALLINDER: I have no questions. I have -- excuse me, before you go off the record, I have here 22 exhibits. Does that match up with your record of what you've got?

MR. EDWARDS: Check mine, too.

MR. ALLINDER: And I think we have got all 22 out here on the table. I went through them earlier, I think before the lunch break or just after the lunch break, so I think

we've got copies of each of those, and Mr. Edwards, when you get a copy of the transcript and the -- you take a look at the highlighting in the copies of the exhibits that you get -- and you can assume, I think, that it's going to be quite similar to the appearance of the copy that Dr. Hamm has, and if you -- or will have, and if you want to do something about that highlighting, why don't you give me a call and let us know. All right?

VIDEOGRAPHER: This concludes the deposition of Dr. Thomas Hamm, Jr. The time is 1:55.

(SIGNATURE RESERVED)

(DEPOSITION CONCLUDED AT 1:55 P.M.)

JURAT

I, THOMAS E. HAMM, JR., DVM, Ph.D., do hereby certify that I have read the foregoing transcript of my testimony, taken on October 3, 1997, and have signed it subject to the following changes:

PAGE	LINE	CORRECTION

DATE:

Sworn and subscribed to before me on this_____ day of_____.

NOTARY PUBLIC _____

STATE OF NORTH CAROLINA)

COUNTY OF MECKLENBURG)

CERTIFICATE

I, Jo E. Fowler, a Notary Public in and for the State of North Carolina, do hereby certify that there came before me on Friday, October 3, 1997, the person hereinbefore named, who was by me duly sworn to testify to the truth and nothing but the truth of his knowledge concerning the matters in controversy in this cause; that the witness was thereupon examined under oath, direction, and the deposition is a true record of the testimony given by the witness.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any attorney or counsel employed by the parties hereto or financially interested in the action.

IN WITNESS WHEREOF, I have hereto set my hand and affixed my official notarial seal, this the 7th of October, 1997.

Jo E. Fowler, Notary Public
My Commission Expires 10/20/01

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